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Improved Water Motor.

Manufacturers have of late made frequent inquiry for a small water motor which should be capable of doing a fair amount of work, be easy to regulate, and not liable to derangement or accident. Printers, in particular, where steam is not available, find such machines useful if water is at hand, and in mining districts they are also employed for driving stamps and pumps or other machinery. They are chiefly intended for application to the pipes of city waterworks; and when thus applied furnish an advantageous and economical power. They are particularly adapted to situations where it is desired to obtain a moderate amount of power; and for driving printing presses, sewing machines, elevators, dentists' and jewellers' lathes; also for hotels where washing, ventilating and pumping machinery is used. They are perfectly safe to use, and require no attendance whatever; they occupy but little room, may be attached to any pipe, and use water only when doing work.

Fig. 1

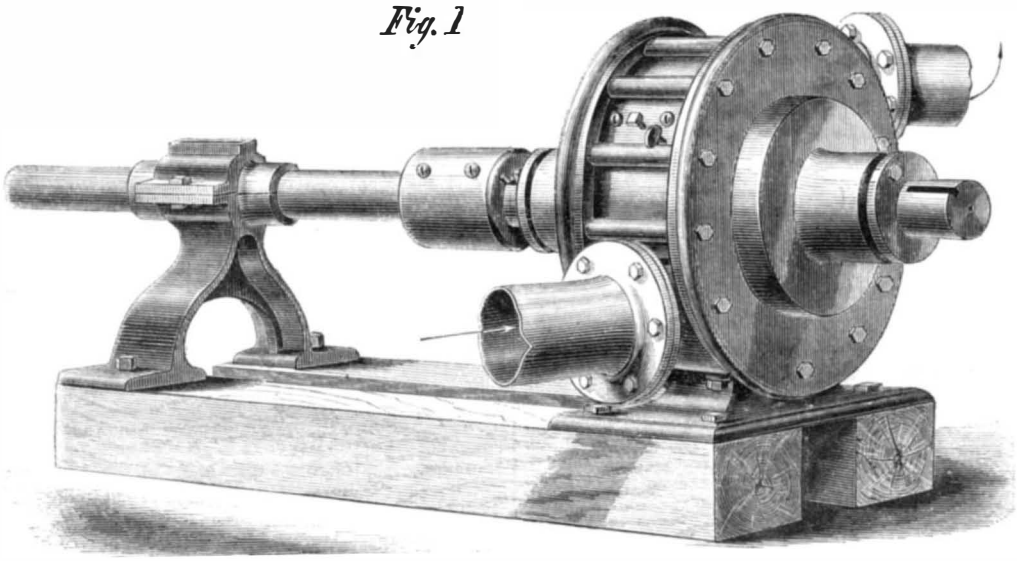
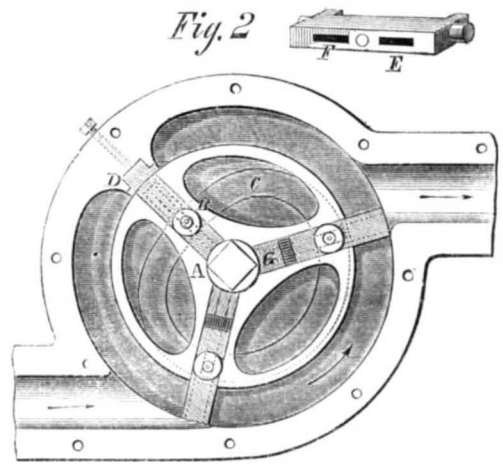


Fig. 2



STANNARD'S WATER MOTOR.

As may be seen, by referring to the engraving, it is simple in detail and within the capacity, as to attendance, of the most unmechanical person.

The section of this engine, Fig. 2, shows the internal arrangement; there are three pistons sliding in the disk, A, having rollers, B, which work in the cam groove, C. This groove regulates the action of the pistons so that they present a fair surface to the action of the water, and the chamber or channel formed by the pistons, and the head permits the water to escape freely at the outlet without undue friction or pressure upon it. The diaphragm, D, divides the chamber into two parts.

By examining the piston shown isolated at E, two water channels, F, may be seen. The water circulates through these channels to the back part, as at G, in Fig. 2, so that the piston is perfectly balanced in its movement and requires no forcing from the cam grooves, C, to make it work properly up to the face of the cylinder; the rollers, therefore, wear a long time without requiring adjustment, as do also the pistons which preserve a regularity of working surface not before attained in engines of this character. This engine was patented by M. Stannard, on the 20th of August, 1861, and is manufactured by Messrs. Pratt, Whitney & Co., Hartford, Conn., of whom all further information can be had.

ROSIN for violins should be melted with a little vinegar.

A Strong Room.

Some particulars of a strong room, for cash and securities, recently constructed for a London bank, may be of use to some of our readers:—The walls are 2 ft. thick, of hard bricks, laid in cement, and with strong hoop-iron in the courses. In the interior there is placed a fire proof Chubb's safe, weighing thirteen tuns. This is 10 ft. long, 8 ft. high, and 8 ft. deep, made of plates 1 inch thick, and secured by two iron and steel doors, having twenty-eight bolts. The remaining part of the brick room is lined with iron, half an inch thick. The whole is again further secured by an iron and steel door, having ten bolts, let into the center of the brickwork; and there is a gate for ventilation in the daytime. A large alarum is fixed in the bedroom of a clerk on the second floor which goes off whenever the outer door is opened, and a porter who sleeps in the office, and whose bed is in front of the door, can also, by pulling a trigger, set the alarm going. The whole of the ironwork, we should mention, was executed by Messrs. Chubb and Son. Mr. P. C. Hardwick is the architect under whom it was set up.—*Builder.*

Genuine Diamonds Found in California.

Stones known as California diamonds have been used by jewellers during the past ten years but it is now ascertained that the genuine diamonds are to be found in the mountain streams of that State—a number of these precious stones have been sent to San Francisco, and Boston—the only place in the United States where diamonds are polished—and have been found to be genuine. Most of these stones were found at Cherokee Ravine, in Butte county; several came from North San Juan, Nevada county, and one was found near Placerville.

The average value was perhaps seventy five dollars, the largest one being worth one hundred and twenty-five dollars. They were found in sluices, or pudding boxes used for placer mining. Several of the miners who found these diamonds in their sluices, stated that they had repeatedly seen similar stones while mining, but supposing them to be worthless had thrown them away.

CALIFORNIA granite is of light gray color, bright and clear, and easily worked. It splits almost equal to slate, and thus requires very little labor in dressing. It is like marble when dressed. Its light color gives a building a bright appearance, as well as avoids discoloration by dust.

Scarcity of Furs—Better Traps Wanted.

The catch of furs this year, says the *North Western Times* has been very little more than half what it was at the same period last season. Mink, which were so plentiful last year, and on which handsome profits were realized, seem to be pretty much a failure all over. This is believed to be the result of the late droughts, and the extermination of the mink by the small American traps now coming into general use. The wooden traps of other days allowed some chanc to these unfortunate animals with the coveted fur, but the steel traps now put in requisition, are certain death, and so the catch will yearly diminish. Despite all the modern improvements in traps which have proved so fatal to the mink, foxes are said to be flourishing and on the increase. They are getting too wary to be trapped in any considerable numbers, it would seem; and indeed their foxships are rather independent this year in consequence of the ease with which they can procure an abundant supply of rabbits; foxes will be fully as numerous next year. Marten are also said to be very numerous in some quarters; but are less plentiful than last year. Buffalo robes must, we believe, be included in the list of partial failures, for very few are offering.

A Locomotive with a History.

Among the locomotives secured by General Terry in his overland movement from Wilmington to Goldsboro', is one that possesses some historical interest, the engine "Job Terry." The "Terry" first came into the possession of the United States military authorities by the occupation of Alexandria, Virginia, in May, 1861; was re-captured by Stonewall Jackson at Front Royal in the famous Banks retreat down the Shenandoah, in the summer of '62; re-captured soon after by the Union forces near Martinsburg, and found slightly damaged; was, however, soon put in running order; ran for us but a short time, again falling into rebel hands at Warrington Junction, Virginia, at the time of Pope's disastrous campaign, doing the rebels service till repossessed for Uncle Sam, a short time since, by her namesake, General Terry. It is fair to assume that the military vicissitudes of this locomotive are at last over, and that while there is steam in her iron lungs it will be respired for the exclusive benefit of the United States Government.

EDWARD HARRIS, the largest woolen manufacturer in the country, intends to build thirty or forty cottages in Woonsocket the coming summer, each one to have a garden, and offer them to industrious mechanics for sale. Who will follow this excellent example?

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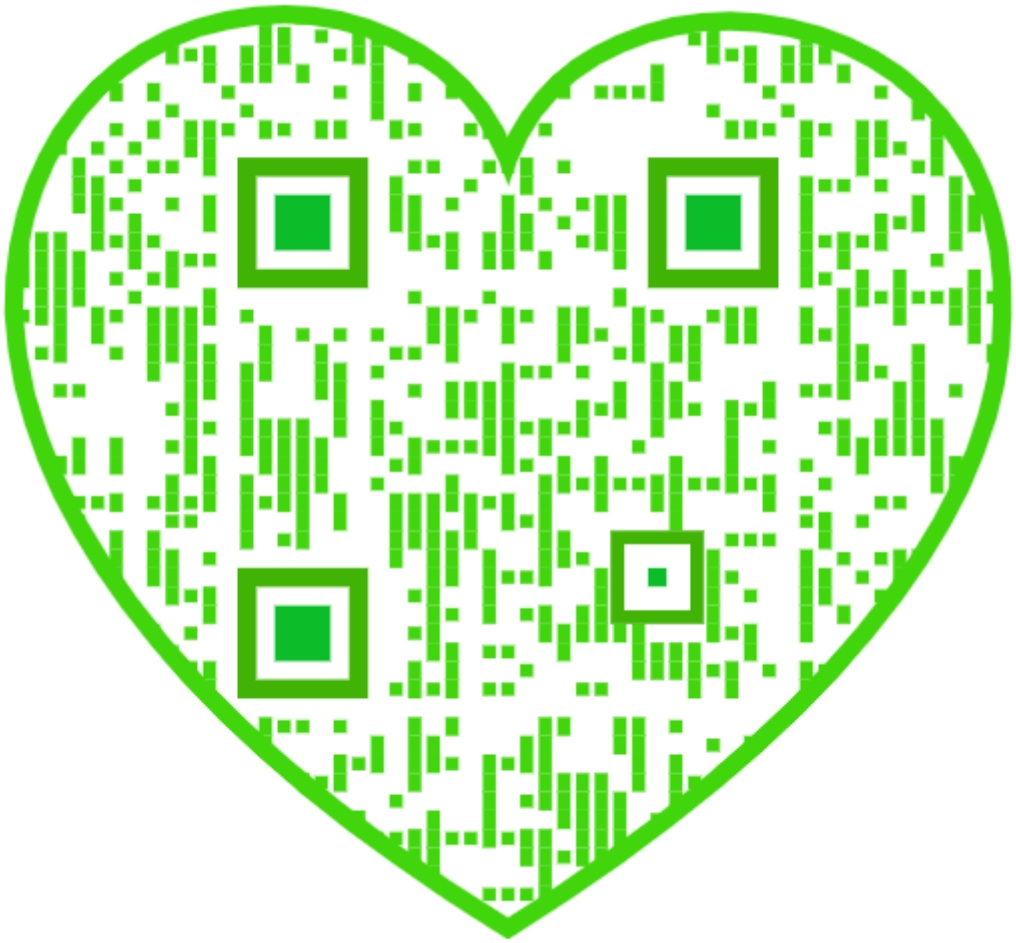

FACTS ABOUT PETROLEUM.

The most celebrated oil-wells as yet discovered and operated on the American continent are located in the western part of Pennsylvania, principally in Venango, Crawford, and Warren counties. The wells next of note are found in Western Virginia and Eastern Ohio; and recently wells have been opened in the States of New York and Michigan, also in Canada.

OIL CREEK.

Oil Creek, which has become celebrated as the site of the richest oil-producing region on earth at the present day, is a tortuous mountain stream, taking its rise in the northern part of the State of Pennsylvania, near the south line of Erie County, and, with its tributaries, waters Crawford and Warren counties, and after a course of about thirty miles through these counties empties into the Alleghany River seven miles above the town of Franklin. The valley through which Oil Creek takes its course is narrow, and flanked on each side by high and rugged hills, on the top of which are broad fields of excellent farming land. The scenery on Oil Creek at one time, no doubt, was quite picturesque; but now the bottom lands are dotted with tall derricks, wooden engine-houses, and iron smoke-stacks, out of which columns of black smoke roll upward to the clouds. The pines and hemlock are cleared from the mountain sides, and all is busy life.

WHERE THEY FIRST STRUCK "ILE"

The extensive lumber saw-mills of Messrs. Brewer, Watson, and Co. were located on Oil Creek, near Titusville, the present metropolis of Petrolia. Near those mills oil first made its appearance in large quantities in this country. Half a mile below Titusville Oil Creek meets its principal confluent, Pine Creek, more commonly known now as the East Branch of Oil Creek; and the delta of these two streams is covered with old oil-pits, which occur at intervals all along the creek below Titusville. These pits are supposed by some to have been the work of the French during their occupancy of the country in 1759, on account of being located almost directly between the French forts of La Bœuf and Venango.

Petroleum, under the name of "Seneca oil"—so called from the tribe of Indians of that name who once inhabited the country—became early of great importance to the settlers, both as a medicine and for burning and lubricating purposes. The greater portion of oil was obtained from two natural springs. One of these was in the immediate neighborhood of Titusville, on the lands now owned by the "Watson Petroleum Company" of New York, on the spot where now stands the old "Drake Well." The other spring was on the farm of Hamilton M'Clintock, within four miles of the mouth of Oil Creek.

HOW OIL WAS FIRST OBTAINED.

During the year 1853 Dr. F. B. Brewer, of the firm of Brewer, Watson, and Co., conceived the idea of collecting surface oil by means of absorbing it in blankets, and wringing the oil out. Great quantities were collected in this novel manner, and used for burning purposes in the lumber mills of the Oil Creek region. The oil produced from the oil springs became so necessary and useful as to suggest the formation of an oil company in 1854 called the "Pennsylvania Rock-Oil Company." This was the first Oil Company ever formed. This was prior to the sinking of any well, or before such a thing was suggested.

THE PIONEER AT WELL-BORING.

Although Professor Silliman of New Haven, had in 1854 analyzed the rock-oil, and pronounced upon its properties, no further developments of any importance took place until the winter of 1857, when Colonel E. L. Drake, of Connecticut, arrived at Titusville, and was the first man who attempted to bore for oil.

He first informed himself thoroughly on the subject of boring, and visited the salt-wells on the Alleghany River for that purpose, where, after some difficulty, he employed a man who agreed to sink wells for the Seneca Company; but he and others to whom he had applied failed to keep their engagements, and it was not until the following spring that he could obtain a suitable person to commence the well.

INVENTOR OF THE DRIVING PIPE.

In sinking the well it was supposed necessary to dig to the first rock; but in consequence of the earth caving in on the workmen so frequently, Colonel Drake invented the iron driving-pipe and mode of driving which is now in universal use, not only in the oil regions, but among the salt borers. He was obliged to go fifty miles to a machine-shop every time his tools needed repairing; but after many delays and accidents, on the 29th day of August, 1859, at the depth of 69 feet 6 inches, he struck a vein of oil, from which he afterward pumped at the rate of thirty-five to forty barrels per day, This is now known as the Drake Well, and was the first well ever sunk for oil, and the first petroleum ever obtained by boring.

EXCITING SCENES.

Now commenced a scene of excitement beyond description. The Drake Well was immediately thronged with visitors arriving from the surrounding country, and within two or three weeks thousands began to pour in from the neighboring States. Every body was eager to purchase or lease oil lands at any price demanded. Almost in a night a wilderness of derricks sprang up and covered the entire bottom lands of Oil Creek. Merchants abandoned their store-houses, farmers dropped their plows, lawyers deserted their offices, and preachers their pulpits. The entire western part of the State went wild with excitement.

FIRST FLOWING WELL.

In June, 1861, A. B. Funk sunk a well 470 feet deep on the M'Illheny farm, which was the first large flowing well. Then followed the Brewer, Watson and Co. Well on the G. W. M'Clintock farm, the Phillips Well on the Tarr farm, the Willard Well on the H. M'Clintock farm and the Rouse, Mitchell, and Brown Well on the Buchanan farm. This latter well flowed a stream of oil without pumping equal to one thousand barrels per day. Thousands of barrels of oil flowed into the creek before suitable tanks could be prepared to receive it.

WELL ON FIRE.

In the midst of the excitement, from some cause unknown, the gas and oil from this well took fire, and, as described by an eye-witness, columns of black smoke rolled upward into the air, the blazing oil leaped heavenward, and, falling over on all sides from the fiery jet, formed a magnificent fountain of liquid fire. The sight was awfully grand, but, sad to relate, nineteen human beings were burned to death. Among them was Mr. Rouse, one of the proprietors of the well.

THREE THOUSAND BARREL WELL.

The next large flowing well opened was the Empire, in the vicinity of the Funk Well, that flowed 3000 barrels per day. The Sherman Well was opened in April, 1862, then the Noble and Delemater Well in May, 1863. This celebrated well was commenced in 1860, and was bored to the depth of 167 feet and abandoned. Mr. Noble went further down the creek and became interested in other wells on the Tarr farm, but in the spring of 1863 he recommenced the work on his old well, and went down to the depth of 471 feet without having any indications of oil. At that depth he concluded to tube and pump, abandoning the idea of obtaining a flowing well, but to the great astonishment of himself and every one else, after pumping a very short time, suddenly the great Noble Well commenced to flow. Long before the opening of this well petroleum had become so plenty that most of the pumping wells were abandoned. Every person wanted a flowing well.

FIRST OIL REFINER.

Samuel M. Kier, of Pittsburg, was the first man who refined the crude oil, and to him we are indebted for this discovery. W. H. Abbott, of Titusville, erected the first large refinery at that place, which was before the days of railroads in that region.

Brewer, Watson, and Co. were really the great pioneers in the introduction of petroleum in large quantities. This enterprising firm expended the sum of $740,000 in cash for barrels alone before they realized one cent of profit. All they required was the actul cost of the barrel. They have lived to reap a rich harvest from the arduous efforts in the introduction of petroleum, and have been handsomely repaid for the hardships and trials through which they have passed.

The only pumping wells opened at an early day, and not abandoned but worked until the present time, are the celebrated Economite Wells, located opposite the town of Tidecute, on the Alleghany River, in Warren County, Pennsylvania. These wells are four in number, and are each now pumping 30 barrels of oil per day. Many persons at the present time, in passing through the oil regions, wonder at the number of abandoned wells to be seen. These wells were not abandoned because the borers failed to discover oil, but simply because it did not pay to operate them when oil was so plenty and cheap and no great demand existed for it.

VALUE OF TRADE.

The importation of merchandise, etc., during the year 1863, over the Oil Creek Railroad, was 70,000 tuns, and the exports of oil alone equal to 750,000 barrels. It is estimated that the export from Titusville will amount this year to over $18,000,000 and the imports will largely exceed those of last year, at least the local trade has kept even pace with the improvements in the way of building.

Oil in quantities having recently been procured north of Titusville, the entire line of Oil Creek above that place, as far as Oil Lake, is now occupied, and numerous wells are in process of drilling, causing great excitement in that region.

Oil City, at the mouth of Oil Creek, is situated at the base of a mountain under a bluff, and for want of room can never become a very large city. The town consists of only one street, winding down the west side of Oil Creek and the Alleghany River. It contains five or six hotels, all of which are crowded nightly with anxious oil seekers. All the business being done on one street the town has a very busy look.

MARKETING OIL.

The oil from these wells on the Alleghany River is taken to Irvine in tow-boats drawn by horses. These boats are built very stanch, and are made to carry from one hundred and fifty to two hundred barrels of oil. The horses often cross and recross, and sometimes pull and tug up through the centre of the river. The driver has regular fords to cross, and it requires as much judgment to drive tow horses up the Alleghany as to pilot a steamboat down the Mississippi.

BETTER MACHINERY WANTED.

In passing through the oil regions of Pennsylvania one is struck with the primitive mode used in obtaining oil. Inferior machinery and exceedingly small engines are used in most cases, with hardly sufficient power to raise the sucker rod out of a deep well. Yet wells are worked in this manner, only producing from one to three, or perhaps five, barrels of oil. Often they entirely fail to get a drop of oil. In such cases the wells are abandoned as worthless. At the same time, if the proper machinery had been applied with more powerful engines, twice or thrice the yield might have been obtained. The air-pump is a great improvement, and its application will no doubt add at least thirty per cent to the yield of all wells to which it is applied.

OIL REFINERIES.

The oil regions are dotted here and there with refineries where the crude oil in distilled and prepared for burning purposes. Many changes have taken place, and vast improvements made, in the refineries of oil since the first were erected. The most extensive establishment for this purpose, now in operation in the immediate vicinity of the oil regions, is at the town of Correy, in Crawford County, Pennsylvania, a new and thriving place, situated at the crossing of the Atlantic and Great Western and Philadelphia and Erie Railroads. The building is entirely of brick, and was erected by Samuel Downer, one of the pioneers in the business, at a cost of $150,000, including machinery. Upward of 200 workmen are here daily employed, and when the works are operated to their greatest capacity 300 barrels of crude oil are daily required.

VARIOUS MATTERS.

New oil lands have recently been discovered in Adams and Sciota counties, on the Ohio River, about ninety miles above Cincinnati. The surface indications are very promising—such as oil on the water in the marshes and water-courses, the upheaval of the sand rock, and hills of shale saturated with petroleum, one tun of which has produced by distillation fifty gallons of oil.

In sinking a well for oil many curious and wonderful discoveries have been made. On the lands belong-

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ing to the Story and M'Clintock Petroleum Company, of New York, located on Caldwell's Creek, near Tiiusville, in sinking a well in October last the drillers passed through a log eighteen inches in diameter.

Oil wells are put down to a variety of depths, from 100 to 1100 feet.

In boring a well a correct journal is kept, showing the different kinds of rock and earth passed through, and the exact points where water-courses, gas or shows of oil are found. If a large vein of oil is struck, the well is immediately tubed with a 2 or 2½-inch iron pipe, put together in sections. The water from water-courses and the surface water is prevented from flooding the well by means of a leathern bag, called a seed-bag, filled with flax-seed, which is placed on the outside of the tubing and within the earth chamber below the water-courses. When the flax-seed becomes saturated with water it swells, and completely shuts off all communication with the bottom of the well on the outside of the tubing.

Preservation of Steam Boilers.

Engineers will appreciate the following information given in the *Mechanics' Magazine* by an English chemist, Mr. Blockly:—

"I have read with great interest your articles on this and its kindred subject, and feel that I only speak the sentiments of the manufacturing community in saying much gratitude is due for the able manner in which the matter has been treated by you. I trust you will allow me to state that the use of 'muriate of ammonia,' or 'sal ammonia,' or 'chloride of ammonium," is not new. The present state of chemistry is such that every known substance has several names. Seven years ago I found it was in use to prevent incrustations, and only for its expense would have been more largely used then. I found also a gentleman of no mean pretensions as a chemist had used a mixture of sulphate of ammonia and common salt, which answered the purpose admirably, forming in the boiler chloride of ammonium and sulphate of soda; the boilers once incrusted did not appear to be cleaned by its use, but incrustation was effectually prevented, only a sludgy, sandy sediment being formed—easily cleaned by blowing off.

"Some localities are furnished with water of a different character, and for a number of years past the use of alkaline preparations has been adopted. Some of these compositions are made by boiling soda ash and lime together in water until the preparation is stiff. Others separate the lime, and stiffen with farina. I can positively assert that the use of alkaline substances is very old. One firm I know of use caustic soda ash regularly, and find it to answer perfectly, and there is a large dyer in this town whose boiler is always free from solid incrustation—the water is of a peculiar character, and contains a large amount of caustic soda as one of its ingredients. The composition you allude to to-day seems to lay claim to novelty—if so, the novelty cannot be from its possessing an alkali as one of its constituents. I have no connection whatever with any firm using boiler power or selling composition, and I would suggest to all users of steam power to try the use of caustic soda ash, a far cheaper material than most of the compositions, which I happen to know are often sold under the recommendation of the foreman or engineer, who gets a 'per centage,' or some other consideration. If this simple remedy does not succeed, I would suggest an examination of the water, and any chemist would undertake to provide some means as effectual as any composition. No one preparation can be expected to, nor does, answer under all circumstances."

A MINING INCH OF WATER.—To machinists and miners in California an inch of water has a specific meaning, as water is sold by the Ditch companies to the mines by the inch, that is, the quantity that will be discharged through an inch opening with a six inch head measured from the center of the opening is called a miner's inch of water. It is nearly equivalent to and is intended to be 1000 gallons passing a given point in an hour.

GEN. SCHOFIELD has levied a contribution of 100,000 rations of meat and flour upon the citizens in the vicinity of our armies at Goldsboro, N. C.

Bitumenized Paper Pipes.

At the late session of the Institute of Engineers, in Scotland, the subject of bitumenized paper pipes was discussed. We extract the mode of their manufacture, and their failure for intended purposes, as reported in the *London Engineer:*—

These pipes consist of a composition of bitumen and paper, and the process of manufacture is as follows:—Paper is made of a breadth equal to the required length of the pipe; a cylinder of the required length and bore of the pipe is selected; upon this cylinder the paper is rolled up, having previously passed through a cistern of molten bitumen; in concert with the cylinder which forms the bore of the pipe, another heavily-weighted cylinder revolves outside, by means of which the pipe in process of manufacture is subjected to great pressure, insuring an equal distribution of the bitumen, and compactness throughout the structure of the pipe. By this mode of manufacture it is evident a pipe of any required thickness can be made by continuing the process for a sufficient length of time. After the pipe is taken out of the rolling machine, and the cylinder forming the bore withdrawn, the inside is coated with an insoluble water-tight composition, which protects the paper and forms a very smooth surface, and consequently diminishes the resistance of friction—a matter of much importance in water pipes. The outside of the pipe is coated with a composition of bitumen and sand, which, besides protecting the material of the pipe from injury, renders it secure against those evils to which iron pipes are liable, either under ground or exposed to the atmosphere.

Mr. W. Simons had seen those pipes laid in France, and knew that many thousands of pounds had been spent in laying paper pipes in Paris, some of them 2ft. in diameter. Mr. Maquet could, perhaps, inform them to what extent this had been done.

Mr. Maquet could not decidedly answer the question; but he had seen them laid in Paris for the supply of gas.

Mr. Copland, borough engineer, Paisley, said he had a line of 4-inch paper pipes laid; and he found great difficulty in getting the pipes jointed, and the service pipes connected with them. These pipes were supplied by the Patent Bitumenized Water, Drainage, and Gas Pipe Company, Limited, who proposed to join the service pipes by drilling holes in the ordinary way. Where the service pipes were connected bitumen was run over to make all tight; but the pipes were not in six months till they required so much repairing that they were glad to get rid of them at any price. They were still under ground, and he had intended to look at them before the meeting, but had been prevented from want of time. He had, however, examined them before, and scarcely found a tight joint in all the 100 lengths laid. The pipes had become quite soft near the joint with the iron pipes—in fact rotton. With the simple pressure of his hand upon a spade he cut in a 4-inch paper pipe at the point of junction with the iron pipe. The pipes were continually leaking at the joints, and they were obliged to send to England for a workman to see if he could do any good to them; but he did not succeed, and they were compelled to lay down a length of iron pipes in their stead. The paper pipes were not jointed like the specimens exhibited, but were entirely fitted with thimble joints, scarcely one of which were tight. The pressure on the 4-inch pipe would be about 10 lb., but at the top of the street it was reduced to 2 lb., and even then it was scarcely possible to get a perfect joint.

Savannah Cotton.

Simeon Draper, Esq., Collector of the port of New York, has made a full report of all the facts connected with the cotton captured by Gen. Sherman at Savannah. The report shows that the total number of bales of cotton taken at Savannah was 38,500; 6,000 bales of which was Sea Island; it had been gathered in from various Confederate States, partly to prevent its falling into the possession of United States forces, but mainly to enable it to be easily shipped by the blockade runners. The greater portion of it belonged to the Confederate Government. Soon after Gen. Sherman took possession of the town many persons went into the warehouses on their own account and secretly marked a large number of bales. Many of these marks represented parties who were dead. The persons who thus marked the bales and professed to be genuine claimants of the cotton were not the legitimate living representatives of the former owners. This cotton is now subject to the order of the Secretary of the Treasury and will soon be offered for sale at public auction.

Machine Molding in Lead Works.

Messrs. Bead and Dent, of Newcastle-street, Strand, have lately introduced a very important improvement into the plumber's art. Hitherto syphon traps have been made by hand, as it was impossible to cast them on loam cores with profit, and apparently no means existed of extracting any other core because of the peculiar form of the pipe. Accordingly, the traps of this kind were always made by beating up two half pipes from sheet lead and soldering the edges together with soft solder; a very good workman and his laborer could produce, on an average, four of these traps per day. The system is open to many objections, of which we may name one; the galvanic action between the lead and the solder leads to the rapid destruction of the metal. Under the new system the cores are formed of gun metal or of cast iron, according to an invention patented by Mr. Lowe, an American, some four years since. Without drawings, it would be impossible to give any idea of the complete machine, for it is nothing else. The traps, whatever their shape, so long as the pipe is circular or nearly so in cross section, are cast entire and of any thickness required, with the most perfect accuracy. Four men can turn out eighteen 3-inch traps per hour, so that the price of production is considerably reduced. The machine is capable of effecting a complete revolution in this branch of the trade, as the work produced is immeasurably superior to anything turned out by hand. The value of the machine is only equalled by its extreme beauty. We know of nothing in the iron or brass trades even distantly approaching it in simplicity and fitness to the required end, and some of the chair molding machines recently introduced are sufficiently elegant.—*Engineer.*

A New Detergent.

A new natural product of California possessing detersive properties is thus described by a contemporary:

"A few months ago, some persons engaged in making turpentine, in Plumas county, tapped some pine trees of a species new to them. The fluid flowed abundantly, but it had a peculiar odor, and when taken to the turpentine stills in the neighborhood, nothing could be done with it. At last it fell into the hands of a man who managed to distil the liquid, which proved to be a new discovery. Instead of the disagreeable odor of turpentine, it has a fragrance like citron, and is free from all resinous matter. Ten gallons of it weighs as much as six gallons and three quarters of pure water. It dissolves all animal and vegetable oils and leaves no stain of its own, nor does it affect any of the colors used in dyeing, and thus it is an excellent substitute for benzine, without the odor which makes the latter substance so offensive. It is also much cheaper than benzine. The new liquid is called 'Erasine,' because of its value for cleansing It evaporates rapidly, and burns well, but is more expensive than coal oil. This novel product of California is now in market."

Perpetual Motion.

Correspondents frequently inquire if our Congress or some foreign scientific or legislative body has not offered a large prize to the discoverer of perpetual motion. No such offer has been made, so far as we know, though in our judgment it would be safe to offer any amount, since there is not the slightest probability that such a discovery will ever be made, It is a waste of both time and money to attempt to get up a self-moving machine. It may be very ingenious in contrivance, but after all it won't go unless force of some kind is applied to it. Every machine must of necessity have a motive power.

ENTERPRISING INVENTOR.—A man down east has recently patented a new boot which he has such faith in that he authorizes dealers to give new pairs where a radical and original defect appears in the stuff or make, provided the same has not been worn to an unreasonable extent before the defect is found out

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POLYTECHNIC ASSOCIATION OF THE AMERICAN INSTITUTE.

The Association held its regular weekly meeting at its room at the Cooper Institute, on Thursday evening March 30, 1865, the President, S. D. Tillman, Esq., in the chair.

A FEAT IN CASTING.

Mr. Norman Wiard described a novel method adopted by him for casting an iron tunnel. When the preparations for casting his great gun were nearly completed a need was discovered for a broad flat tunnel some ten feet in diameter. Not having conveniences at hand for making it of boiler plate, it was necessary to cast it, and as there was not time to make a pattern, he determined to cast it flat, and attempt to shrink it into dishing form as it cooled. He swept an open mold and filled it with molten iron. The center was first cooled, and as the edges began to harden levers were placed under opposite sides, and weights were hung upon their ends, tending to pry up the edges while the center was held down. Thus the rim was started up a very little, and then as it cooled and shrunk around the previously hardened center, it arose ten inches, giving this depth of dish to the tunnel.

TANNING.

The regular subject of the evening being tanning, the President explained that this is a simple chemical process. Raw hide is composed to a large extent of gelatin, which is soluble in water and is subject to decay. If gelatin is brought in contact with tannic acid the substances combine to form a new compound, which is insoluble and very permanent. The action is instantaneous, but when tannic acid is applied to raw hide it causes the fibers to contract, thus closing the pores and preventing the acid from penetrating the interior. Hence the necessity for soaking the hides several months in the liquor.

Mr. Smuhl, a retired leather dealer, gave a brief history of tanning in this country. Most of the improvements have been mechanical, improved arrangements of the vats and apparatus to save labor in pumping the liquid and handling the hides. As the tannin combines with the gelatin, the weight of the hide is increased by tanning; 100 lbs. of dry hide can be made into 180 lbs. of tanned leather, and 2000 lbs. of bark are required for the operation. Formerly the manufacture was conducted mostly in this city, and Colonel Edwards was the first who adopted the plan of carrying the hides to the bark, instead of transporting the bark to the hides.

Many efforts have been made to concentrate the tannin extracted from the bark, and by bringing that to the city, save the great expense of transporting the hides back and forth. But none of these efforts have proved successful.

A patent has recently been taken out by Mr. Pinkery for extracting a further quantity of tannin from the spent bark by means of steam, and the right for this State has been sold to one of our shrewdest tanners for $25,000. The plan is simply to saturate the spent bark with steam till it gets as hot as the steam, and then drench it with clean water. There is a notion that leather is improved by lying in the vat many years. This is a mistake. Provided the leather be thoroughly tanned the more quickly it is tanned the better. As good leather is made in this country as is made in any part of the world, but it is not as universally good as the English leather.

It may interest some of our citizens to know that New York is the largest market for sole leather in the world. More sole leather is bought and sold in this city than in Liverpool, London, and Paris combined.

From such facts as I can gather, I estimate that about 10,000,000 hides are tanned annually in the country. This would require about 700,000 cords of bark, and as the average yield is about 10 cords to the acre, there must be not far from 70,000 acres of hemlock forest cut down every year. As hemlock does not sprout again we are rapidly diminishing the area of our bark producing forests. The principal growth of hemlock is in Maine, New York, Michigan and Iowa, and I estimate that the area of hemlock forest in these states is not less than 40,000 square miles, 25,600,000, acres which would furnish 70,000 acres a year for 366 years.

A STEEL wire may be made from an iron one by plunging it into melted cast-iron.

FARMERS' CLUB.

The Farmers' Club of the American Institute held its regular weekly meeting at its Room at the Cooper Institute on Tuesday afternoon, April 4, the President, N. C. Ely, Esq., in the chair.

From the several subjects discussed we select the following:

IMPROVED PLAN FOR TAPPING MAPLE TREES.

Mr. N. Smith, of Delhi, Carrol County, Ind., sent a communication, saying that he had found in tapping maple trees that a tin tube turned round a seven-inch wire and inserted in a gimlet hole in the tree would yield as much sap as could be obtained from an augur hole. This small hole will not injure the tree, and the plan enables very much smaller trees to be tapped.

PRESERVING LEAVES WITH THEIR NATURAL COLOR.

Solon Robinson read a letter inquiring the best plan for preserving leaves with their natural color.

Mr. Dodge replied that the best method is to wet the leaves well, and then iron them with a hot flat in precisely the same way that linen is ironed.

Mr. Robinson said that dipping the leaves in gum-arabic or glycerin has been recommended.

THE EASIEST WAY TO PULL STUMPS.

Mr. Carpenter, in reply to an inquiry, said that he had tried several plans for getting rid of stumps, and the one that he found the cheapest and most satisfactory is to let the tree pull its own stump at the time it is felled. Instead of chopping off the tree above the surface, the ground is dug away, and two or three of the principal roots are cut off at a sufficient depth to escape the plow; then the first moderate wind blows the tree over, stump and all. I think the expense is no greater than that of chopping the tree in the usual way, and I get an increased yield of wood.

SHEEP DESTRUCTIVE TO FLEAS.

Mr. Collins, of Otsego County, N. Y., said that it is well known that sheep occupying barns or premises will soon rid them of fleas. He supposed the fleas get entangled in the wool and perish.

CHEDDAR CHEESE.

Mr. Collins exhibited a sample of cheese made by him in imitation of the famous cheddar cheese of England. He said the most interesting thing in relation to it is the fact that it brings forty cents a pound by the case in this market. The essential points in the manufacture are, first, not to scald the milk; the milk is warmed about 90°, and the rennet is introduced at this temperature; then the curd is handled with so much care that the butter globules are not broken, thus preventing the butter from being washed away in the whey.

The French Ammonia Engine.

They are discussing just now in Paris a proposal for propelling omnibuses and other vehicles by means of ammonia. The engine which it is proposed to apply to this purpose is the invention of Mr. Tellier, and is a very simple and ingenious contrivance. A brief description of it will enable the reader to judge for himself how far it is likely to prove of practical value. Ammonia, under ordinary conditions, is a gaseous body, but there are various methods by which it can be readily condensed into a liquid, when in which state, unless it be restrained by sufficient pressure, a temperature below that of the freezing point of water is sufficient to convert it into gas again. Mr. Tellier takes advantage of this property of that body as follows:—He places liquefied ammonia in a suitable vessel, connected by a pipe and stop-cock with a cylinder having a piston fitted to work in it. When the stop-cock is opened, a portion of the liquefied ammonia becomes converted into gas, which rushes into the cylinder and raises the piston. When the gas has thus forced the piston to the top of the cylinder, a little water is admitted under the piston. Water and ammoniacal gas having a most eager affinity for each other, this water instantly absorbs all the gas, thereby causing a vacuum under the piston, and so enabling the pressure of the atmosphere to force the piston back to its original position. When the piston is once more at the bottom of the cylinder, the stop-cock in the pipe communicating between the cylinder and the vessel containing the liquefied ammonia is again turned, more gas is thus admitted beneath the piston, and all proceeds again as before. For obvious reasons, there should be at least two cylinders—M. Tellier prefers three—to each engine. The quantity of liquefied ammonia required per horse power per hour is stated not to exceed three gallons, weighing twenty-two pounds. The water used to absorb the ammonia, after it has re-assumed the gaseous form and in that state has done its work under the piston, is not thrown away, but is saved for the recovery of the ammonia from it,—which may be effected by simple evaporation, with certain precautions,—in order that the recovered ammonia may be re-condensed and so used over and over again.

For use in this way ammonia possesses great advantages over air. In the state of gas, ammonia occupies more than twelve hundred times the bulk which it occupies in the liquid state, and yet liquefied ammonia, if the vessels containing it be surrounded by some frigorific mixture, which need neither be costly nor difficult to prepare, will not exert against them a pressure of more than a few pounds per square inch, whereas, if it were practicable to compress air to the same extent, the air so compressed would exert against the vessels containing it a pressure of more than three-quarters of a tun per square inch,—a pressure, of course, which no vessel of any considerable size could possibly be made capable of bearing. In practice, however, it would not be possible to compress air to anything like the same extent as ammonia. It would probably be difficult, working on the great scale, to condense air much beyond the point at which it would press with a force of a hundred pounds on every square inch of the interior surface of the vessels containing it, at which degree of condensation it would be just two hundred times more bulky than the quantity of liquefied ammonia capable of doing the same amount of work, while it would be much more than two hundred times less portable, since the vessels used to store it in, while having two hundred times the aggregate capacity of those used for storing the liquefied ammonia, would have to be capable of bearing on every inch of their enormously greater surface a pressure twenty times greater than the vessels containing the ammonia need be capable of bearing per inch. Moreover, a force-pump worked by a steam engine would be the only practicable means of condensing air on the great scale; but ammonia can be condensed by a much more simple method. A steam engine is simply a machine for converting into mechanical force the heat developed by the combustion of the coal used under its boiler. The force exerted by the steam engine all comes from the coal burnt; it is, in fact, the heat given out by the coal in burning, in another form. In condensing air by means of a force-pump, worked by a steam engine, we employ the heat obtained from coal to convert water into vapor, and employ this vapor to drive machinery which shall work the piston of the force-pump, and so compress the air. Gaseous ammonia may be condensed in the same way; but it may also be condensed without the intervention either of a steam engine or of any piston-and-cylinder apparatus whatever. A common laboratory and lecture-room experiment consists in placing at one end of a bent tube some compound capable of giving off ammonia under the influence of heat, applying heat at that end of the tube, and keeping the other end of it cool,—both ends of the tube having been carefully sealed. Gaseous ammonia is given off at the heated end of the tube, and by its own pressure becomes converted into a liquid at the other end. Ammonia admits of being condensed on the great scale on precisely the same principle as in this experiment. Altogether, therefore, M. Tellier may be regarded as having fairly found in liquefied ammonia what inventors have sought so long, and so vainly, in compressed air,—a cheap and convenient method of storing up mechanical power, so as to admit of reservoirs of it being transported to a distance from the spot at which it was generated, and of the stored-up power being there applied useful to do work by means of light, simple, cheap, and safe machinery. We shall be surprised if it do not prove that the ammonia engine has much good work to do for the world in many ways besides that of propelling carriages.—*Mechanics' Magazine.*

FATS and vegetable acids may be cooked in hot copper sauce-pans without danger, since the metal is not attacked by them except when cold.

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Artificial Limbs.

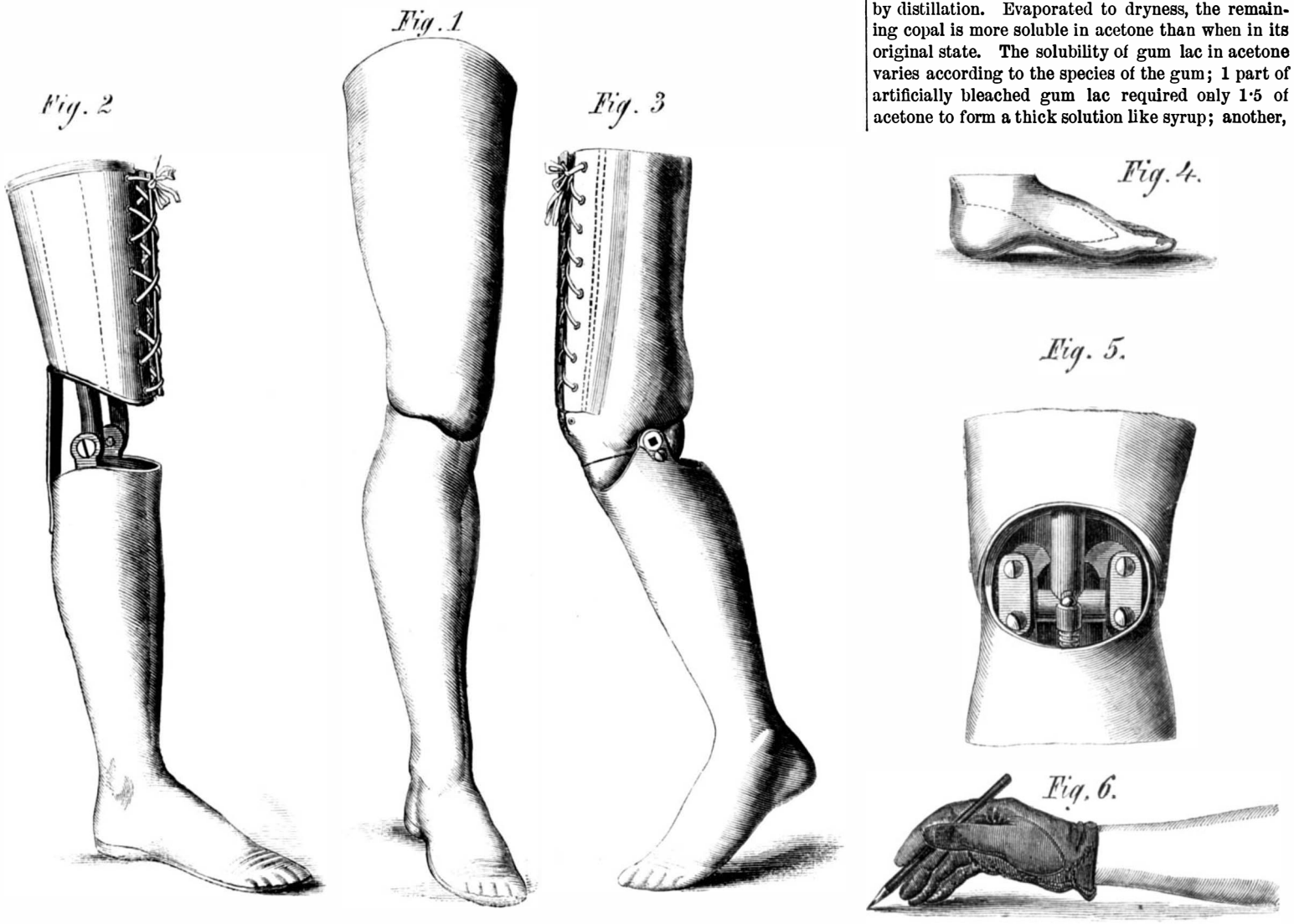
The engravings published herewith represent artificial limbs which have novel features not heretofore obtained in them. India-rubber is largely used in their construction, the feet and hands particularly being constructed of this substance.

No. 1 presents a full length leg standing erect, to be applied in all cases where amputation occurs above the knee joint.

No. 2 represents a leg to be applied where the leg has been amputated below the knee joint, and the stump is flexible enough, and sufficiently long, to enable the wearer to use it in walking. It also represents the leg with the heel compressed, and in its joints in these limbs the necessity for which being entirely obviated by the elastic rubber foot, which gives all the motion required in walking, and also the ease, firmness, elasticity and reliance absolutely necessary in a perfect artificial leg.

It would seem at first sight that no one could walk well on any artificial leg without the moving, flapping ankle joint, but practice proves this to be erroneous.

The rubber foot, also, gives all the required lateral motion to the foot when stepping upon sidling or uneven ground. This leg dispenses with all machinery of whatever character, and has been in use for the last two years giving great satisfaction.



MARKS'S ARTIFICIAL LIMBS.

position after taking the step, and when firmly planted on the ground.

No. 3 is termed a knee bearing leg; it is to be applied where amputation takes place below the knee, and where the stump is too short, or contracted at right angles, so the knee joint cannot be used in walking. This figure represents the leg slightly bent at the knee, and bearing well upon the toe, as in the act of lifting it to take the next advance step.

No. 4 is a view of the India-rubber foot before being applied to the leg. This rubber foot constitutes the main feature in the legs shown in the figures. This foot is made mostly of india-rubber of a very spongy, light and elastic character. A piece of willow wood, nearly filling the rubber heel at the top or surface, where the leg rests, runs down about one-fourth of the distance towards the lower part of the heel; also forward and downwards to the joint at the ball of the foot, as shown by the dotted line. This piece of wood is the base upon which the foot is built, and is also the medium whereby the foot is joined firmly to the leg. The leg itself is made of light, tough willow, in all cases except the thigh piece shown in figure 2, and the front part of the thigh piece in figure 3, which are both made of leather. The entire leg and foot in all cases is covered with fine buckskin, neatly coated with a life-like water-proof finish, making it both light and strong.

It will be seen that there are no movable ankle-

Figure 5 gives a rear view of the knee joint of the long leg, (Figure 1,) the T joint is fastened to the upper part or thigh piece of the leg, and the gudgeons of the T are held in adjustable, oblique boxes which are easily set at any time by the screws passing through the caps into the main leg, and operating upon the spiral spring, so as to throw the foot forward when bent in walking, and so as to hold the foot under when bent at right angles in a sitting position. This feature has been secured by a separate patent, dated March 7, 1865. Figure 6 shows a rubber hand, made same as the foot, of which there can not be as much said, as of the other inventions. It corresponds, however, with the others, in its characteristic features of simplicity and durability, and wholly dispenses with machinery, giving a softness to the feeling and an elasticity which is very desirable. It is as useful as any hand yet invented, which is not probably saying much in its favor, as no art yet shown, if it ever will, can compare with "nature's handiwork." A patent for this hand has also been obtained, as in fact have all of them, through the Scientific American Patent Agency. These inventions have caused a great change for the better in the appearances of those who have lost natural limbs, and must give great relief to the maimed. The inventions, in dispensing with so much machinery, reduce the expenses of repairs very greatly, as there is no complicated gearing to get so often out of order. For further information address the inventor and manufacturer, A. A. Marks, 575 Broadway, N. Y.

Manufacture of Varnish.

Some attentton has been given to the use of acetone in the manufacture of varnish, by M. Wiederhold, according to whom acetone rendered anhydrous by rectification over chloride of calcium readily dissolves cold copal which has been previously heated to the point of fusion. Only 2·8 of acetone are required for 1 of copal, and a copal varnish is thus obtained which dries almost instantaneously, leaving a hard, brilliant and durable coating. A more concentrated and almost syrupy solution is obtained, without separating any copal, by expelling part of the acetone by distillation. Evaporated to dryness, the remaining copal is more soluble in acetone than when in its original state. The solubility of gum lac in acetone varies according to the species of the gum; 1 part of artificially bleached gum lac required only 1·5 of acetone to form a thick solution like syrup; another, a colored specimen of gum lac, was almost insoluble; and a third required 3·5 times its weight of acetone to dissolve it. Acetone dissolves with especial facility, and in considerable quantities mastic and sandarach; dammar, yellow amber, and india-rubber are, on the contrary, almost insoluble. The solution of acetone and mastic produces a very beautiful and brilliant varnish. M. Wiederhold is of opinion that acetone might be employed for the restoration of oil paintings deteriorated by the alteration of the varnish which often becomes opaque from the effect of a molecular modification, and which, from a vitreous and transparent state, becomes crystalline or pulverulent. By carefully applying acetone the opaque varnish may be momentarily dissolved, and will then redispose itself, but in a vitreous state.—*Mechanics' Magazine.*

A METHOD of exhibiting diagrams of apparatus, etc., by which lecturers may be saved the expense of the large drawings generally used, has been suggested by M. Thibierge, of Versailles. His plan is to make a small sketch of the apparatus on a plate of glass, and with a large lantern to throw a magnified image on a screen. The lantern he illuminates by an ordinary gas burner with twenty-four holes, and with two silvered reflectors finds the light sufficient even to give a well defined image of the electrolysis of water.

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Correspondence

Rules for Screw Cutting.

MESSRS. EDITORS:—At several times, during a few months past, I have seen in your valuable paper directions for calculating the relative proportion of the teeth of wheels used in cutting screws in engine lathes. I have taught a great many persons to make these calculations, and I know that a large majority of machinists need some very simple process by which to make them. The last rule which you published I think is the best one for single gearing, and the one which I always use, but I have not seen a plan for getting at the combination in double gearing which is simple enough. Lathes are very easily made to use either double or single gearing for screw cutting, and it adds very much to their usefulness to make them so.

I have a lathe here which I made last fall in that way, and also to cut scrolls with the same gears in the same positions except one gear which is changed, that is to say, if gears are put on to cut a screw of ten pitch, by moving one gear a scroll of ten pitch can be cut.

My plan for calculating the number of teeth to be used with double gears is the following:—Suppose the leader to be 10 pitch; we want to cut a screw of 50 pitch; our gears range from 20 teeth increasing in number by 4 up to 80. I begin with the leader and the largest gear, say 80. Leader, 10×gear, 80=800.

Multiplying the pitch of the leader by the number of teeth in gear, the product I divide by the number of teeth in a smaller gear, say 20. 800÷20=40. The quotient (40) I now regard as the pitch of a new leader and proceed as in single geared lathes, my practice being this, for convenience: Leader, $40\times1\frac{1}{5}=48$; Screw wanted, $50\times1\frac{1}{5}=60$. On inspection we find that the gears are ranged thus: 80 goes on the leader; 20 goes on the stud and meshes with 80; 60 goes on the stud with 20, and 48 goes on the spindle, or the arbor which the spindle drives, and meshes with 60.

Where the spindle drives an arbor at a different velocity from its own this must be taken account of, and we must be governed accordingly, but there are but few builders who make them so; I know of but one (Putnam Machine Co., of Fitchburgh, Mass.) As I had to use a fraction in this example I will change it a little: Leader, 10; screw wanted, 40. Gear, 80×10=800; this dividend by 40, the number of teeth in gear to run with 80, gives 20, which, as before, is our new leader, and we go on as thus: Leader, 20×2=40; screw wanted, 40×2=80; position on lathe similar to the foregoing example. It is necessary to keep the head clear in determining their positions when the right gears are found.

I have been so minute because I know that a great many do not understand the rules as generally given. In one establishment where I have worked, where about two thousand men and boys are employed, I did not find one who could make the calculation for cutting screws with double-geared lathes.

WM. A. CHAPIN.

White River Junction, Vt., March 16, 1865.

Drying Grain for Market.

MESSRS. EDITORS:—In your issue under date of April 1 you have a short article under the head of "damp corn," and editorially ask "Why does this happen?" etc. I will answer so much of the question as relates to the dampness of corn stored through the winter embargo. It is this: Farmers think best as yet to store their grain at home rather than risk it in large cities. This home storage is of necessity where the grain can receive little, if any, treatment in the way of handling or airing, consequently it heats, and loses a certain per centage of its value. This is the reason why so much damp corn comes to market on opening of navigation. It is no new thing, but, on the contrary, is as old as the business. When the winter has been of a certain kind, more dampness shows itself than at other times. Accumulation of moisture is rather a rule than an exception.

It is not for the interest of the farmer, all things equal, to keep his grain at home, but rather to hasten it to market the moment the crop is gathered and ready to move. Could this be done, he saves interest money, and at the same time has his grain where it can be used as a capital to help on the next crop, or, if necessity requires it, for quick sale.

The remedy for this complaint of dampness is plain. Build, in New York City especially, a class of storehouses that will induce the farmer to store here over and above his out of the way places at home. These buildings must be strictly fire-proof, and of such materials as to be *sanitary* with reference to keeping the grain cool and dry, also free from the depredations of rat and weevil.

Fire proof means a building that has no wood in it, consequently will not burn or in any way risk its contents.

Sanitary means constructed of such materials that heating and dampness are impossible, and that rat and weevil cannot exist.

With such buildings the farmer could store here cheaper than at home. Here he would be free from the hard tax of insurance, and from the losses and depreciation consequent upon dampness and waste by insect and vermin. The depreciation by dampness alone would often pay more than six months' storage at New York rates.

Could a thoroughly fire-proof system of storage for grain be instituted here, the farmer would not be long in finding his interest in it, for New York is the great financial and export depot, where his grain will always bring the most money, either for loan or sale.

WM. S. SAMPSON.

New York, March 30, 1865.

[An obvious remedy for damp corn is to store it in ventilated cribs, so constructed that the heat and moisture can ascend from the center of the mass, where it heats most. All grain is not sent to market, and farmers lose as much on that stored for home use as on that sold where heating takes place. A ventilating crib can be found illustrated on page 49, vol. X., SCIENTIFIC AMERICAN.—EDS.

Peat.

MESSRS. EDITORS:—As so much is being said and written upon the subject of peat and its value for heating purposes, and inasmuch from the tenor of the articles one would naturally infer that it was an entirely new thing, I beg to offer a few remarks relative to the matter.

I fully agree with the writer of an article upon this subject which appeared upon page 100, current volume, of your paper in relation to its value for fuel. In Barnstable County, in the State of Massachusetts, of which place I have the honor to be a native, there exist extensive beds or deposits of peat, from which large quantities have been extracted for fuel for domestic uses from, I might say, time immemorial; and it is with emotions not certainly bursting with pride that I look back upon the days of my youth, when your humble servant might have been found toiling to increase his worldly resources at the rate of about twenty cents per day at the not particularly inviting occupation of "turning peat." It usually sold for from $5 to $8 per cord, oak wood selling at about the same price—the peat possessing the advantage that it required no sawing or splitting in order to prepare it for use. On the other hand, however, there is a good deal of waste from crumbling. Especially is this the case with peat from some localities, while from other locations it is very firm and hard, scarcely crumbling at all.

The process of manufacturing is as follows: The peat is dug with a kind of long spade made especially for the purpose, and is spread upon the ground in beds of five or six inches thick, from one to a dozen rods long, and from six to ten feet wide. It has to be tempered with water sufficiently to make it pliable enough to spread it easily, after which it is cut into blocks or cakes about five or six inches square, for which purpose a knife is used, which is usually made by fastening an old scythe to the end of a pole of suitable length. It is then allowed to remain for a week or ten days, according to the weather, or a time long enough to enable it to dry sufficiently to admit of its being "turned," which operation consists in separating by hand, and turning each block upside down, and placing them far enough apart as to admit a free circulation of air for the purpose of drying thoroughly, which generally takes two or three weeks, according to the weather, after which it is ready for housing for use.

For domestic uses, not the least important part is to have it thoroughly dry; if so, it usually burns very freely, leaving no cinders, and making very little smoke. The smoke it does make, however, has a very disagreeable odor, which pervades the whole house.

The ashes were never considered to be of any value—not at all to be compared to wood ashes.

As I have already remarked, there used to be large quantities manufactured every year, but of late, owing to the cheapness and general use of coal, its manufacture has been in a measure discontinued, and the peat bogs have nearly all been converted into cranberry patches, which I believe have proved to be a source of far greater profit.

GEORGE C. PAINE.

San Francisco, Cal., March 13, 1864.

Re-shingling Roofs—Ventilation.

In the summer of 1863, says a correspondent of the *Canada Farmer*, I had occasion to renew the shingles on the roof of my dwelling. Instead of taking off the old ones, I covered them with mortar, and then, with nails about half an inch longer than the common ones, I put on the new, a plan which makes a roof safer from fire, warmer and better every way, than if I had taken off the old, as is generally done, or put the new upon the old without mortar between them. The idea of putting mortar between the old and the new shingles is not original with me, but I was the first, so far as I know, to do it; and I would recommend it to all who require to renovate the roofs of their dwellings, as there is no other way that they can gain so much advantage at so little cost.

Now as to the ventilation of bed-rooms. One small room full of air, used by two or three pairs of lungs, for some eight or ten hours, is not fit for breathing. To keep up a supply of fresh air in my bed-rooms, I have a hole in the stove pipes, passing through them, some two and a half inches wide by three and a half long, with a slide valve, on the same principle that the sliding cover is fixed to the opening of a powder canister. I have the hole about six feet from the ground on the side of the pipe next the bed so that it can be seen when lying upon the bed. I do not find it necessary to close the opening at any time, although it is, I presume, best to have it fixed as above described, so as to be able to do it if required. Through this opening there is a constant current of air from the room into the pipe, as is seen by holding a candle to it, or a piece of rag or paper. The current of air is never reversed, and no sparks ever come out of the pipe, consequently there is no danger from fire, as some might suppose, from having a hole of this size in the pipe, and the effect is that a constant supply of fresh air is kept in the room, and I know of no way in which thorough ventilation can be so easily obtained.

A New Microscope of Astonishing Power.

A foreign contemporary says:—It is not many months since one of the most eminent of living microscopists expressed his conviction that in the production of object glasses with a one-twenty-fifth of an inch focus the microscope had reached its utmost attainable limit of perfection. He added that "it appears impossible to separate or define lines more numerous than ninety thousand in an inch, on account either of the decomposition of light, or some other cause. It therefore seems beyond our power ever to discover more of the ultimate composition of bodies by means of the microscope." It is always foolish to use such "thus far and no farther" language in reference to any department of scientific research, but it is not often that its fallaciousness has been demonstrated within so short a period as in the present case. The above extract is taken from a journal dated December 10, 1864; and yet, already, the one thing which microscopists are now talking about is an object-glass with one-fiftieth of an inch focus, recently made by Messrs. Powell and Lealand, which was described to the Royal Society by Dr. Lionel Beale the other day, and was exhibited at the annual conversazione of that Society a short time since. This object-glass possesses double the power of the one which we were so lately told, and by so

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great an authority, was the most powerful we must ever expect to possess, and defines with wonderful distinctness particles which the latter cannot render visible at all. It magnifies three thousand diameters, with the low eye-piece, or, with a Number Five eye-piece, fifteen thousand diameters—that is to say, in popular parlance, one thousand five hundred and seventy-five millions of times! It must immensely increase our knowledge of the lower organisms, and may even aid our researches into the ultimate constitution of matter. And who shall say that even its powers may not be exceeded in time?

MISCELLANEOUS SUMMARY.

SPECTACLES FOR HORSES.—The United States *Gazette* relates the following incident: A gentleman had an old and valued horse whose sight was defective. For some time past the quadruped evinced a tendency to stumble, and to strain his sight at objects close to him, in a manner that set the kind-hearted owner to devising a remedy. The gentleman judged that, with a pair of spectacles, the horse would do as well as when in his prime. An optician ground to order a pair of pebble glasses, about the size of the object glasses of a large sized lorgnette. They were fixed in a frame over the horse's eyes. That animal is now a horse in spectacles, and not an elderly gentleman ever yet showed greater appreciation of the convenience. When in the stable the spectacles are removed.

TO KEEP EGGS.—M. Burnouf recommends, in *Le Belier*, a French journal of agriculture, the following method of preserving eggs:—Dissolve in two-thirds of warm olive oil one-third of bee's-wax, and cover each egg completely with a thin layer of this pomade with the end of the finger. The egg-shell by degrees absorbs the oil, and each of its pores becomes filled with the wax, which hermetically seals them. M. Burnouf affirms that he has eaten eggs kept two years in this manner, in a place not exposed to too great extremes of temperature. He thinks also that the germ may in this manner be preserved for a considerable time.

A NOVEL MODE OF COAL-SELLING.—An exchange says: In London and Liverpool coal is delivered in bags, and some of the Philadelphia dealers, acting upon this hint, have established a new mode of delivering anthracite. The coal, carefully screened, is placed in square iron boxes, each holding about seventy-five pounds. These, to the required number, are placed in appropriately constructed wagons, and the boxes being delivered over the open sides of the vehicle are conveyed directly to the bin without dust or dirt either in the street or within doors. The new plan seems to us to possess many advantages over the old system.

ALUMINUM ethide and methide were recently described by Dr. Odling, at the Royal Institution, as colorless liquids. The ethide boils at 149°, and does not freeze at —18°. The methide boils at 130°, and solidifies at a little above 0° into a beautiful crystalline mass. Both liquids take fire on exposure to air, and explode violently by contact with water. They are produced from mercuric ethide and methide respectively, by heating these compounds for some hours in a water-bath, with excess of aluminum clippings

THE Paris correspondent of the *Chemical News* refers to the following scientific curiosity. If a crystal of sulphate of copper or sulphate of iron be put into a very dilute solution of silicate of potash, a sort of mineral vegetation grows up of the same color as the sulphate. In fact, a miniature forest may be obtained at the bottom of a jar, and by placing the crystal on the top of a layer of well-washed sand colored with a little bichromate of potash; the appearance is given of an artificial soil greatly resembling a natural gravely deposit.

CAR BRAKES.—Mr. A. I. Ambler, of Detroit, who has secured several patents through the Scientific American Patent Agency is about to apply his improvements in car brakes to the Michigan Central R R Mr. Ambler has made this subject a protracted study, and we wish him much success in his efforts to introduce his improvements, which we hope soon to illustrate in our columns.

LONG JOURNEY FOR A LETTER.—Recently a number of the old-fashioned, worn-out mail pouches, from some of the western post-offices, was received at the Washington post-office. In one of them a letter was found postmarked "Vandalia, Ill., March 2d, 1836." It contained information in regard to a lawsuit before "a justis," upon which an appeal had been taken, requiring "twenty days' notice," and came to light twenty-nine years and twenty-three days after it was mailed, having been carried about all that time for ten cents.

BLAKELY GUNS MADE IN MASSACHUSETTS.—The Putnam Machine Company have completed at their manufactory in Fitchburg a couple of 11-inch cannon, of the Blakely pattern, which weigh upwards of 43,000 pounds apiece. The breech is clad with a thick steel jacket, and this jacket is encircled with steel rings, making a thickness of about 12 inches of solid steel around the castings. They are for the defence of Boston harbor and cost about $25,000 each.

VALUE OF RHUBARB FOR DOMESTIC WINE-MAKING.—The cultivation of the rhubarb wine plant is attracting some attention at Fentonville, Mich. Last year two gentlemen procured 1,000 plants and set them out upon half an acre of ground 3x4 feet apart, and from the shoots they manufactured 440 gallons of wine, worth in this and Eastern markets $3 per gallon. It is called American sherry, and is said to possess valuable medicinal qualities, besides being a fine rich-flavored beverage.

ARRIVAL OF CHOICE SEEDS.—The Commissioner of Agriculture has just received another lot of choice seeds, such as he has uniformly received and distributed. Among them are fine specimens of barley, oats, buckwheat, Alsike clover, varieties of bush beans or runners, pearl or round Turkey peas, Brussels sprouts, early short-horn carrots, turnip-rooted celery, large white kohl rabi, and varieties of white and red cabbage.

GOVERNMENT EMPLOYMENT OF WOMEN.—There are about 700 female clerks employed in the Treasury Department, and selected from almost all the States in the Union. Many of them have been rich but are now poor. Their chief business is in cutting and counting new legal tender and national bank notes, and in counting and destroying old ones. Their pay is $720 per annum each, for about six hours close work per diem.

AN EGG CARRIER WANTED.—Eggs are usually packed for market in oats, that grain having been found the best for the purpose. They are apt to get musty, however, and the eggs do not always arrive in good order, by any means. The oats also take up a good deal of room that might be economized, besides being very dear at the present time. Here is an opportunity for the ingenious. Time and money would be saved by a suitable egg carrier, both for market and family use.

REBEL PATENT OFFICE —In our last number we alluded to the operations of the rebel Patent Office for the year 1864. Judging from the events of the past few days we presume that the business at that office has come to a stand still. Commissioner Rhodes, we presume, has gone off with his master Jeff to parts unknown.

RELATIVE DENSITY OF POPULATION.—Ireland still supports 184 souls to every square mile, France only 178; Spain supports only 80 souls to the square mile, Austria only 148, Prussia only 172, Bavaria only 161, Sweden and Norway only 19, European Russia 32. Only Italy, England, Holland, and Belgium are more thickly populated than Ireland.

IT is announced that an inventor residing in Pittsburg, has challenged Sir William Armstrong to a trial in November next; each piece to be fired two hundred consecutive times.

Having a poor opinion generally of Sir William's gun we do not think our countryman would gain much renown by achieving a victory.

High Winds in England.

They have some high winds in England, as may be seen by the following lines cut from the *London Engineer:*—"It may be interesting, in connection with the north-eastern district, to note the fact that a railway train was stopped near Jarrow, last week, by the force of a furious north-west wind."

New Application of Spectrum Analysis.

The *Chemist and Druggist* says: There seems to be no end to the applications of spectrum analysis. With the wedge of glass, chemists, astronomers, and physiologists are opening Nature's safes, and disclosing things of inestimable value. Now, a new metal is brought to light; now, the constitution of the sun's burning atmosphere is revealed; and now a problem respecting the nature of the celestial nebulæ is solved.

In a paper, recently brought before the Royal Society by Dr. Henry Bence Jones, the latest application of spectrum analysis is described. It occurred to the author that it might be possible to trace the passage of substances from the blood into the textures of the body by the aid of the spectroscope, and, with the assistance of Dr. Dupre, he has obtained some very remarkable results.

The metal lithium, which can be readily detected, when in extremely minute quantities, by the spectroscope, was selected as the substance to be traced, and guinea-pigs were generally used for the experiments. Usually, no lithium could be found in any part of their bodies; but when half a grain of chloride of lithium had been given to a guinea-pig for three successive days, the metal was detected in every tissue of the body. Even in the non-vascular textures, as the cartilages, the cornea, the crystalline, lithium was found.

Two animals of the same size and age were taken; one was given three grains of chloride of lithium, and was killed eight hours afterwards; the other, which had no lithium given to it, was also killed. A piece of the lens, 1-20th of a pin's head in size, taken from the former, showed the lithium spectrum distinctly, proving that the metal had penetrated to the very centre of the lens. When the whole lens of the other animal was burnt at once, no trace of lithium could be detected.

A patient, who was suffering from diseased heart, took fifteen grains of citrate of lithia thirty-six hours before her death, and the same quantity six hours before death. The crystalline lens, the blood and the cartilage of one joint were examined for lithium: in the cartilage it appeared very distinctly; in the blood exceedingly faintly; and when the outer lens was taken, the faintest possible indications of lithium were obtained.

Another patient took ten grains of carbonate of lithia five hours and a half before death: the lens showed very faint traces of lithium when half the substance was taken for one examination; the cartilage, however, showed lithium very distinctly.

The importance of these results cannot be questioned. Our most valuable medicines, like the salts of lithium, belong to Graham's class of crystalloids, or diffusible substances; and their rapid action upon the system can now be partially understood. We trust that Dr. Bence Jones will continue his investigations, for the results already arrived at lead us to believe that spectrum analysis may do much for Therapeutics.

The National Debt.

The official statement of the public debt on the 31st of March shows that the amount outstanding bearing interest in coin is $1,100,361,241, the interest being $64,016,631. The amount bearing interest in lawful money is $751,055,128, the interest being $38,819,899. Debt on which interest has ceased, $349,420. Debt bearing no interest, $515,189,287. Total amount outstanding, $2,366,954,077. Total interest in lawful money and gold, $102,836,531.

The following is the amount of legal tender notes in circulation:—

One and two years five per cent notes.....	$69,522,350
United States notes, old issue	492,104
United States notes, new issue	432,668,465
Compound interest notes (act of March 3, 1863)	15,000,000
Compound interest notes (act of June 30, 1864)	141,477,650
Total.....	$659,160.569

The amount of fractional currency is $24,254,094. Unpaid requisitions, $114,256,549. Amount in the Treasury, $56,481,925.

PRECISION.—Precision is a good trait of character. A writer in a late number of an agricultural contemporary says that 24 days, 12 hours, 43 minutes, and about 62 seconds is the turkey's natural time to sit.

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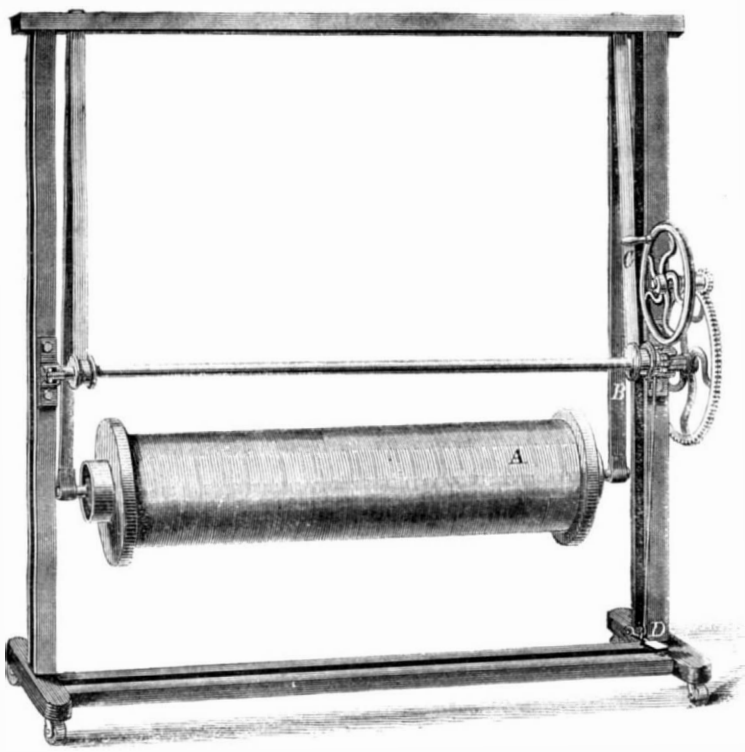
Warp Beam Elevator and Transporter.

The value of this machine can readily be seen by the practical manufacturer. In the dressing department, heretofore, the necessary qualification in the helper has been strength instead of intelligence, and at times the overseer has been seriously troubled to obtain men who were strong enough to handle the beams, particularly on heavy work; very few men could be found who would not break down under this severe, constant labor. With this machine this difficulty is entirely obviated, while the labor of at least one man is dispensed with. Any person of ordinary intelligence can operate it. Being mounted on casters it can easily be moved in any direction and

Fig. 1



SAUNDERS'S WARP BEAM ELEVATOR AND TRANSPORTER.

quickly adjusted, relatively, to the warper, dresser or drawing-in frame, for the purpose of receiving or depositing the beam. The warper, dresser or drawing-in hands can easily change their own beams, without loss of time in waiting; oftentimes this will prove a great convenience aside from the absolute saving of time.

The operation is simple; the journals of the beam are inserted in the loops of the straps, and the power is applied to the handle on the balance-wheel; a ratchet gear on the main shaft, with a pawl attached to the frame prevents the beam from running down while being raised; this pawl is connected by a wire to a treadle, D, by means of which, the pawl can be held out of gear, while the beam is being lowered into its required position. This machine is in successful use in some of the best mills in the country. It was patented on the 16th of August, 1864. For further information address the manufacturer, A. H. Saunders, Nashua, N. H.

CAMP NELSON WATER WORKS.

A correspondent sends us a description of the water works constructed for the supply of Camp Nelson, Ky., under the direction of Capt. T. E. Hall, formerly of General Burnside's staff. The only thing that we discover in it worthy of note is the hight to which the water is forced at a single lift, this being 478 feet, measured vertically. As the water in the river rises and falls at its various stages 60 feet, the engine was placed on trestle work 75 feet above the river at its lowest stage. A simple lift and plunge pump is employed, with a pump rod of 3-inch iron 75 feet in length. The pipe through which the water is forced up into the reservoir is of cast iron 8 inches in diameter, and 60,000 gallons are raised every twenty-four hours, supplying a camp of 10,000 men and 12,000 animals. The water is distributed throughout the camp of 4,000 acres in service pipes, and the whole cost of the work was $35,000. The works are very creditable to Capt. Hall's engineering skill.

SAUNDERS'S IMPROVED BOBBIN.

The object of this improvement is to avoid the waste which usually results from the manner of attaching the yarn to the ordinary bobbin during the process of doffing, or applying it to the spinning frame. With the ordinary bobbin the yarn is wound a few times around the barrel until there is sufficient friction to hold it securely when the full one is broken off, invariably leaving the end of the yarn flying; this flying end will get crossed and entangled in the first layer of yarn, and in unwinding, on the spooler or warper, or in the shuttle, the yarn will break, leaving more or less on the bobbin, constituting waste, which, at the present or even at the old prices of cotton, forms no inconsiderable item in the cost of manufacturing; very much of this waste is not apparent as yarn-waste, as the short pieces are unwound and thrown upon the floor, and appear in the waste account as sweepings.

Fig. 1

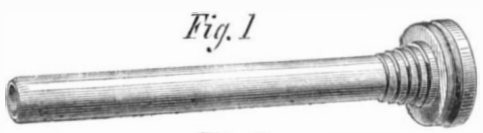
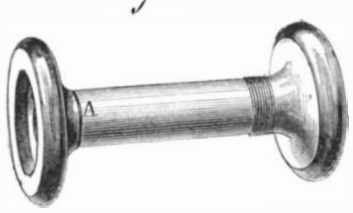


Fig. 2

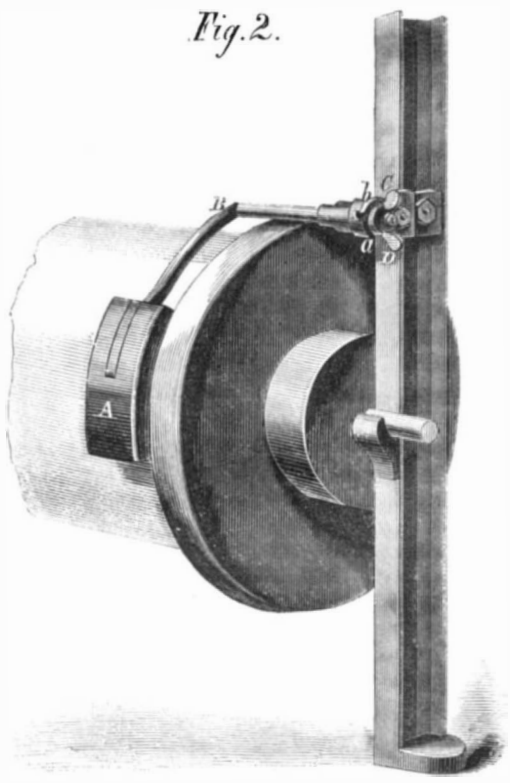


This improved bobbin has an angular or V-shaped groove, A, cut into and extending entirely around, the barrel, at the foot of the taper of the head; the doffer has only to wind the yarn once, or at most twice, around the barrel of the bobbin, in this groove (the taper of the head serves as a guide to the yarn, without any particular care on the part of the doffer), break off the full bobbin close up to the groove, a habit easily and naturally acquired, and the end of the yarn is secure; the drag of the bobbin only serves to hold it more securely. The inventor guarantees that not a particle of waste will be made by leaving yarn upon this bobbin; it takes less time to doff; every end is securely fastened by the first attempt, so that the frame starts up at once, without any subsequent stopping to secure the loose and flying ends. This hitching groove can readily be made in any ordinary warp or filling bobbin; in fact, the inventor prefers to apply his groove to them, as the wood is harder and smoother after they have been used. Patented August 25, 1863. For further information address B. Saunders, Nashua, N. H.

SAUNDERS'S FRICTION WEIGHT FOR BEAMS.

This invention has been made with the view to obtain a friction on the beam that will give a uniform tension on the yarn, and thereby prevent breakages in the loom. To obtain this the inventor uses a weight, A, which rests upon the yarn on the section beam, near its head; this weight is held by an arm, B, to which it is attached in such a manner that it

Fig. 2.



will conform to the surface of the yarn; this arm passes through a stand, C, which is bolted to the dresser frame, fitting so that it will readily turn in the bearing; on the end of this arm a thread is cut to fit a thumb-screw, D; this latter has a groove, *a*, turned in its circumference, in which a pawl, *b*, is fitted to retain it in its position; this pawl is attached at its other end, to the stand, and so that it can be raised up and out of the grooved nut, to allow the arm to slip through when the beam is to be changed. It will readily be seen that when the beam is full, the weight will be at nearly a right angle with the stand, giving a friction equal to its full weight, but as the yarn is unwound, and the deam grows smaller, the weight conforming to the surface will drop and be supported by the arm in the stand more and more, in exact proportion to the decrease of the diameter, and of course the friction will decrease in the same proportion. Ordinarily, with good warping, this friction will be sufficient, but if the number of the yarn is not uniformly the same, and care is not taken to weight the beam properly on the warper, it will become necessary to have more friction than the weight affords; this can be obtained by turning the wing-nut, which will bring the side of the weight to bear against the inside of the beam head, and the friction can be increased as much as may be required. The bearing surfaces of the weight are covered with leather, to avoid injury to the yarn and beam head. Actual use, says the inventor, has proved that this friction weight will save more than one half of the usual number of breakages in weaving. All things being equal, the inventor guarantees fifty per cent less breakages of the yarn in the loom with this weight on the dresser than with any other now in common use. It was patented Nov. 15, 1864. For further information address B. Saunders, Nashua, N. H.

THE breech-loading rifle Commission at the Springfield armory are very busy completing their work, and will, no doubt, strongly urge the adoption of the breech-loading rifle.

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Contents:

(Illustrations are indicated by an asterisk.)

*Stannard's Water Motor..... 239
A Strong Room..... 239
Genuine Diamonds Found in California..... 239
Scarcity of Furs—Better Traps Wanted..... 239
A Locomotive with a History. 239
Facts About Petroleum..... 240
Preservation of Steam Boilers. 241
Bituminized Paper Pipes..... 241
Savannah Cotton..... 241
Machine Molding in Lead Works..... 241
A New Detergent..... 241
Perpetual Motion..... 241
Polytechnic Association..... 242
Farmers' Club..... 242
The French Ammonia Engine. 242
Artificial Limbs..... 243
Manufacture of Varnish..... 243
Rules for Screw Cutting..... 244
Drying Grain for Market..... 244
Reshingling Roofs—Ventilation..... 244
A New Microscope of Astonishing Power..... 244
Peat..... 244
Miscellaneous Summary..... 245
High Winds in England..... 245
New Application of Spectrum Analysis..... 245
The National Debt..... 245
*Saunders's Beam Elevator and Transporter..... 246
Camp Nelson Waterworks.... 246
*Saunders's Improved Bobbin..... 246
*Saunders's Friction Weight for Beams..... 246
The Great Victory..... 247
Knowing Too Much..... 247
Strikes..... 247
Value of Coal Ashes..... 247
Microscopic Objects..... 248
Recent American Patents..... 248
Patent Claims.....248, 249, 250
Notes and Queries..... 251
*Bond's Step Ladder..... 254
A Rare Mineral..... 254
Bleaching Sponge..... 254
Wild Peppermint as a Rat Exterminator..... 254

THE GREAT VICTORY.

There was satisfaction in Athens when the overwhelming danger to the Republic from the hosts of Darius was scattered at the b . tle of Marathon; there was relief throughout Greece when the still greater power of Xerxes was broken at Platæa; the bells of England rang with gladnes when the Invincible Armada was swept away by the fleets of Elizabeth; but never since the beginning of the world has there been so wide-spread, exalted, and profound joy as that which filled the hearts of the American people when the telegraph flashed the intelligence over the land that the central power of the rebellion was broken in pieces.

And well we might rejoice. This great event stirred all the emotions of the heart. It appealed to all that is weakest and strongest, to all that is highest and lowest in human nature. The first thought was a feeling of triumph over the formidable enemy that was struggling to destroy the nation, an enemy defiant, haughty, contemptuous and absolutely fiendish in his malignant cruelty. But the strongest emotion was gratitude for the safety of the unity and power of the nation through the great peril. It was well understood that the question at issue was, whether this country should be broken up into hostile and contending fragments, burdened with the support of vast armies and navies, passing the time in brief alternations from peace to war, now watching with jealousy the growth of each other's power, and now cutting each other's throats; or whether we should be one great, united, harmonious people, settling our disputes by decisions of the Supreme Court, with the inconceivable blessings of popular education spread throughout our borders, with an organized, prosperous, contented and hopeful industry, with the means of happiness more abundantly and more widely diffused, and with the masses of the people raised higher in the scale of humanity than has ever yet been known in the history of the human race.

For the right determination of this great debate the heart of the nation is moved with inexpressible gratitude to the brave and devoted soldiers of our patriot army. Among so many thousands there are doubtless considerable numbers of scoundrels, but on the whole there has never before been marshalled in the ranks of war a body of men so high in all mental and moral attributes as those who are now engaged in the glorious work of crushing to earth the last remnants of this most wicked rebellion. The army that came nearest to ours was doubtless that of the Roundheads of England, but when we consider the progress that has been made since 1640, in civilization, and especially in general education, there can be no doubt that our soldiers are superior in intelligence and character even to the fine body of men that were led to invariable victory by Oliver Cromwell. Braver than the "Ironsides" it were perhaps impossible for soldiers to be, but impartial history will pronounce those not less brave who bent their heads and went forward through the withering fires of the Wilderness, and dashed themselves so many times against the impregnable defences of Spottsylvania.

With this gratitude to the soldiers comes the slow but inevitable recognition of the greatness of their commander. General Grant may not have an intellect superior in its power of comprehending problems, but through all future generations his memory will occupy the very highest position among those eminent men who have been great in action. The mind that he has is all wisdom; it is a guide to conduct; it throws its light upon the untrodden way. His judgment is healthy and sound, and is not disturbed by collateral and irrelevant considerations. "He has one of those rare intellects that across the maze of immaterial facts goes straight to the true point."

But the judgment of General Grant would have done nothing towards accomplishing his great achievements without those strong qualities which have carried his decisions into effect. His power of dispatching business brought all departments of his great army into the highest perfection of organization and discipline. He has, too, in an eminent degree that highest courage which has been rare indeed among the commanders of armies—the moral courage that dares to take the responsibility of battle. But the strongest element in his character is his inflexible tenacity of purpose. It is not the patience that waits in idleness, but the active perseverance that works and waits—the instinctive determination that is stimulated to more dogged obstinacy by the encounter of unforeseen obstacles, and that never thinks of looking back. This is indeed the most powerful quality in human nature, and in a contest it decides the victory. Said Wellington at Waterloo—"Three times I have saved this day by perseverance," the triumphs of Marlborough were due to the same spirit, and the highest appreciation of the noble character of Milton has declared its crowning grace to have been "his sublime and majestic patience."

The surrender of Lee, with his whole army, is a fitting conclusion of the masterly generalship of Grant and the splendid fighting of his noble army.

KNOWING TOO MUCH

"A little knowledge is a dangerous thi .g," says Pope, and the truth of it was brought forcibly to our mind recently, when visiting a machine shop. The foreman was telling an apprentice how to do some part of the work when the youth interrupted him, saying—"I know all about it—I can do it myself." "Well!" said the foreman in reply, "I have been twenty years in this business and I can't say that I know it all. I am content to learn every day, and I think after you have lived a little longer you will find what I say to be true."

It was; we corroborate it.

It is natural that a youth should be hasty, and in the pride of his initiation into a few mysteries of his trade, fancy he is master of it all. But time brings experience to him as to us all, and that is the light which reveals, not how much but how little we know.

All knowledge is comparative, and the greatest minds are not the most ostentatious—not the most boastful of their accomplishments—but are content to acquire a little every day, to add to their stock. "There is no royal road to learning," which is to say, that the man in humble life has as fair a chance as the rich one, and that money cannot purchase mental ability, although it may bring privileges for information. In the pursuit of knowledge with facilities, not under difficulties, we are all dependent one upon the other. The practical man has his experience to demonstrate that certain effects spring from specific causes; the scientist brings his knowledge of physical laws and the properties of matter generally to bear upon the solution of a given question, and both classes work to mutual advantage; for one to sneer at the other as a visionary, or as an artisan, as the case may be, is to show how a little knowledge can be made a dangerous thing.

STRIKES.

If the story of a helpless child starving to death is told in simple narative and minute detail, it moves the sympathy, and harrows the soul of every reader; it sinks into the heart, and fastens upon the memory so that it can never be forgotten. But if the story is of many hundreds or thousands perishing by starvation, the magnitude of the suffering removes it from the scope of our sympathy.

By this principle in human nature, we all fail to form any conception of the wasting woe that is now filling thousands of households among the iron workers of England. The 70,000 men that were thrown out of employment by the great lock-out, have no means of obtaining a subsistence for themselves and their little ones but their own skilled right hands, and these are now hanging idle by their sides, in consequence of a quarrel between themselves and their employers.

While it is beyond the power of our imagination to conceive the cruelty upon the part of the iron masters which could arbitrarily bring this wide-spread suffering upon their colaborers, we are prompted to enquire whether the conduct of the workmen has been so marked by common sense and judgment as to make it a guide for imitation. This great crisis brings up anew the ever recurring question in relation to the wisdom of strikes.

There are two kinds of strikes, and one of these must certainly command the approval of all who really sympathize with the masses of mankind. That is the strike of the individual, who accumulates capital by saving till he can leave his service and go to work upon his own account. All the advance that has been made in wages, from a few pennies a day up to as many shillings or dollars, has been effected by this operation. The price of labor, like the price of everything else, is fixed by an inexorable law of nature, which no man can alter—the law of supply and demand. The demand for labor depends upon the amount of capital seeking to hire laborers. Every man who withdraws himself from the body of employed and adds himself to the body of employers, exerts a tendency by both operations to raise the wages of labor. We may hate, we may even despise, this miserly spirit, but we cannot deny that we are indebted to this very spirit of accumulation for the superiority of wages in this country and England over those in India and Ceylon.

In a nation of educated and provident workmen large numbers of individuals are constantly passing from the class of hired to that of hirers, and wages consequently are steadily advancing, without any jar, without any ill will, without any suffering. We raise no quarrel with those who think it wise and profitable to organize strikes. We are well content that every man should determine his own course in accordance with his own judgment. But for our own part, the agencies to which we look for securing a perpetual advance in wages, are common schools and savings banks.

VALUE OF COAL ASHES.

The *Manchester Courier* of March 11th says:—"It seems that an extraordinary rise has taken place in the value of ashes in London. A short time ago the parish of St. Pancras had to pay contractors to take them away from the houses in the district, but it has now, in consequence of the augmented value, conceded the right to collect them to Mr. Ferguson, of Paddington, for which he has paid no less than £1,800, although the concession is only for six months. But the high price tempts other speculators to poach on Mr. Ferguson's manor and yesterday morning he had to bring a man named Bridges before the Clerkenwell magistrate, for purchasing ashes of the inhabitants on his own account. The magistrate said he was determined to protect the contractor, and fined the unauthorized collector, £2. As he was unable to pay that sum he was sent to prison for three weeks."

It would be very interesting to know for what purpose these ashes are used. Muspratt gives analyses of nine samples of Scotch and Welsh coals; and of

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these that from Porthmawr in Wales is about an average specimen. Its constitution is as follows:—

Silica	34·21
Alumina and oxide of iron	52·00
Lime	6·199
Magnesia	0·659
Sulphuric acid	4·12
Phosphoric acid	6·633
Total	97·821

The other samples are formed wholly of these same substances, but in different proportions. The silica and alumina would doubtless be combined as silicate of alumina, which is clay.

The lime would be combined first with the phosphoric acid which in this specimen would take it all. The compound formed would be phosphate of lime. This is commonly said to be insoluble and worthless, the biphosphate or super-phosphate being the soluble and highly prized fertilizer which produces such magical effects. The phosphate is, however, soluble to some extent, and is not wholly worthless as a fertilizer.

In other samples of coal ashes which have been analyzed, the quantity of phosphoric acid was not sufficient to take up all the lime, and in these cases the remainder of the lime would enter into combination with the sulphuric acid, forming sulphate of lime. This is known under the names of gypsum and plaster of Paris, as a very valuable fertilizer.

It may be that the ashes of English coals contain these two substances, phosphate of lime and sulphate of lime, in sufficient quantities to make them valuable as manures. It would be a little surprising, however, if their value for this purpose should be so great as to make the privilege of collecting them in a single district for six months worth $9,000. This circumstance suggests the possibility that some rare metal or other valuable substance may have been discovered in them. It also suggests the desirableness of a more thorough examination of the ashes of American coals. The constitution of these is, however, so different from that of the ashes of English coals, that it by no means follows that any substance occurring in one will be found in the other.

MICROSCOPIC OBJECTS.

"All that tread
The earth are but a handful to the tribes
That slumber in its bosom,"

says Bryant, speaking of the human race. With equal truth it may be said that all the hosts of mankind who have been born into the world since the creation, are but a handful to the countless myriads of beings that swarm in that invisible world which has been revealed to us by the magical power of the microscope. When we reflect that each one of these beings has his own needs and desires, his loves and battles, his career from life to death; and that every drop of every stagnant pool has been teeming with them for immeasurable ages before the existence of the human race, the mind is overwhelmed in the effort to conceive the vastness of this creation. It is an impressive thought that mankind should have lived on the same planet with this world of sentient beings for so many thousands of years without any suspicion of its existence.

It is not strange therefore, that when the discovery was made, the minds of men should be turned to the examination of their minute, strange and curious contemporaries, and that this study should be prosecuted with ever-widening interest. That this is the case we are very frequently reminded by some improvement in the microscope, by some discovery through its aid, or by some work upon its use.

We have now before us a book of 140 pages on "The Preparation and Mounting of Microscopic Objects," devoted exclusively to this department of microscopic observation. The various methods of attaching the minute specks to glass slides, so that they may be brought under the focus of the instrument, as well as the balsams and cements employed, and the different modes of preparing the objects, are very fully and intelligently discussed.

The work is by Thomas Davies, and is published by William Wood & Co., 61 Walker street, New York.

A PINE tree was lately cut in Colebrook, Conn. for the shaft of a big wheel for a Manufacturing company, which worked thirty-six inches in diameter and twenty-six feet in length. The stump was six feet through.

RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:—

Protector for Baskets.—This invention consists in applying a metallic frame to baskets in order to protect the same or preserve them from wear or injury. The inuention is chiefly designed to be applied to large baskets or those in which weighty substances are conveyed or carried, such, for instance, as bushel baskets used by farmers and others, coal baskets for carrying coal, &c. Baskets of this kind are soon worn, cut, broken or destroyed, in consequence of the weighty substances carried in them, and a metallic frame renders them durable, serving as a support to the basket in holding its contents and likewise protecting it from external injuries, such as blows, concussions, &c. Philip Eley, of New York city, is the inventor.

Means for Raising Oil from Wells.—This invention relates to a new and improved means for raising petroleum in wells through the medium of air injected into them. The invention has for its object, first, the keeping of the air passage free from mud, sand, etc., which are liable, in the old plans, to choke all said passage; second, in having the air passage so arranged that it will not interfere in the least with the ascent of the oil in the oil tube, nor the oil interfere with the current of air—due provision being also made for the difference in the exhaustion of the oil tube and well pipe, as well as for the ready connecting and disconnecting of the several parts. The above invention is by Messrs. L. W. Turrell, Samuel Stanton, and L. C. Ward, Newburgh, Orange Co., N. Y.

Winding up Watches.—This invention consists of a main spring barrel composed of two barrels, one inside the other, the outer barrel being rigidly connected with the main gear wheel, and the inner barrel carrying the winding arbor, the main-spring and the maintaining ratchet, or its equivalent, in combination with two stops or dogs, one applied to the inner, and one to the outer barrel, in such a manner that, when the spring is wound up the inner barrel turns independent of the outer barrel until the two stops are in contact, and when the main spring breaks the inner barrel flies back and completes a full revolution, or nearly so before its stop strikes the dog of the outer barrel, and thus the force of the spring is spent, and injury to the mechanism of the watch is prevented. Invented and patented by G. C. Martin, Cleveland, Cuyahoga Co, Ohio.

Roller Cleat for Trunks.—This invention consists in the arrangement of mortises or cavities in the cleat of a trunk, in combination with rollers, the axles of which have their bearings in the sides of said mortises or cavities in such a manner that the rollers can be secured to the cleat without the use of a metal bracket, and a simple, cheap and durable fastening for said roller is produced. The ends of the cleat are made thin and turned up over the edge of the trunk in such a manner that, by the cleat, the edge and ends of the trunk are protected, as well as its bottom, and the cleat is less liable to be knocked off than it is when attached to the bottom in the ordinary manner. John A. Lieb and John Schmadel, of 69 Prince st., Newark, N. J., are the inventors of this improvement.

PURIFYING WATER.—A Mr. H. A. Sheldon sends the following account of an experiment to purify water:—"Having occasion to purify river water which was colored by passing through swamps containing muck, peat, and other decayed vegetable matter, I tried the usual method with alum, which deposited the mechanical impurities but left the water the color of pale sherry wine. I then mixed 1 oz. powdered alum and 2 oz. clean white clay together, for one barrel of water, made a thin paste and stirred it with the water, which, in twelve hours, was perfectly transparent and colorless. The precipitate in the latter case was of a dark chocolate, in the former a pale ashen color."

MESSRS. DAVISON, STILES & WOOLSEY, 229 Broadway, are the agents for the traveling and steam cranes illustrated on page 190 of the current volume. All letters should be addressed to them.

ISSUED FROM THE UNITED STATES PATENT-OFFICE
FOR THE WEEK ENDING APRIL 4, 1865.

Reported Officially for the Scientific American.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

47,080.—Cigarette.—L. L. Arnold, New York City:

I claim, First, As a new article of manufacture, a cigarette, constructed and combined in the manner described, and,

Second, The method herein described of making the same.

47,081.—Cabinet Organ or Harmonium.—Thomas Atkins, Cincinnati, Ohio:

I claim so arranging the stops or swells of an organ or harmonium with regard to a common lifting piece, F, operated by a foot or knee pedal, as that they may all, or any one, two or more of them, be opened or closed by said pedal, without raising the hands from the keys, substantially as herein described.

47,082.—Manufacture of Blacking, Etc.—Roberts Bartholow, Cincinnati, Ohio:

I claim the manufacture, compounding and preparation of a new and improved kind of oil blacking for leather, boots, shoes, harness and other articles manufactured, in whole or in part, of leather, composed of the ingredients above named, and manufactured, compounded and prepared in the manner and for the purposes substantially as set forth at large above.

I also claim, as a new manufacture, oil blacking for leather and other articles, made by combining petroleum or any of its products, or other hydro-carbon oils, treated substantially as hereinbefore set forth, with any suitable acids, oxides, gums or resins, substantially in the manner specified.

47,083.—Oil for Paint.—Roberts Bartholow, Cincinnati, Ohio:

I claim the manufacture and preparation of a new and improved kind of oil for mixing and compounding with white lead, zinc, white and other mineral paints and pigments, in lieu of linseed oil and other paint oils, and for other purposes, composed of the ingredients above named, and compounded, manufactured and prepared in the manner and for the purposes substantially as set forth above.

47,084.—Process for Preparing Petroleum for the Manufacture of Paint, Etc.—Roberts Bartholow, Cincinnati, Ohio:

I claim the manufacture, compounding and preparation of paints for common purposes, of various colors and shades of color, and embracing all colors and shades of color, from crude petroleum and refined petroleum, in combination with sulphuric acid, nitric acid, acetic acid, common glue, dry white lead, otherwise known as carbonate of lead, dry white zinc, otherwise known as oxide of zinc, and other white pigments, and pigments of various colors, combined in the proportions and in the manner substantially as set forth above.

47,085.—Machine for Securing Soles to Boots and Shoes.—John Blakeney, Philadelphia, Pa.:

I claim, First, The screw rod, I, and its internal wire, x, and the nut, composed of the arms, G and G', or their equivalents, in combination with the system of gear wheels herein described, or the equivlent to the same, whereby the said screw rod is caused to revolve at a faster speed than the nut, for the purpose specified.

Second, Two or more cutters, 4 and 7, arranged in the projection, m, of the rocking frame, in respect to the wire, x, in combination with the slotted plates 10, or their equivalents, for adjusting the said cutters, as set forth.

Third, The support, 24, adapted to the last, in combination with the movable plate, Y, and the devices herein described, or the equivalent to the same, whereby the said support can be adjusted vertically and laterally, in the manner described.

Fourth, The combination of the plate, Y, adjustable piate, 14, rocking frame, 19, adjustable support, 24, and sliding support, 15, the whole being arranged and operating substantially as and for the purpose herein set forth.

47,086.—Spring Bed Bottom.—J. Blair Bowditch, New Haven, Conn.:

I claim the combination of the slats, B B, with the wooden springs, D D, as herein described, for the purpose specified.

47,087.—Lamp Cone.—Charles H. Buckalew, Jersey City, N. J.:

I claim the construction of the cone frame with a metallic base and bifurcated connecting arch, with a filling or dome of glass blown or cast within the said frame, substantially as herein described and represented.

[This improvement relates to the construction of the air cone or flame deflector which surrounds or covers the upper part of the ordinary kerosene or petroleum oil lamps. The improvement consists in forming the cone of glass and metal combined. A frame of metal is first made, corresponding to the shape of the cone; this frame is then filled with glass, when hot, by pressure. A transparent cone is thus produced, the use of which results in obtaining probably twenty per cent more light from lamps to which the improvement is applied.]

47,088.—Breech-loading Fire-arm.—John W. Cochran, New York City:

I claim, First, So constructing and applying a breech block, having a movement such as is herein described, as to provide for the insertion of the cartridge into the barrel from the under side of the stock of a fire-arm, substantially as herein specified.

Second, Providing a cavity, c, substantially as herein described, in the under side of such a breech block, for the reception of the cartridge when the gun is in the inverted position shown in Fig. 3, whereby the movement of the said block which is necessary for the insertion of the cartridge into the chamber of the barrel is greatly reduced, and the discharged cartridge shells are steadied while being withdrawn from the barrel.

Third, The construction and arrangement of the rear end of the breech-operating lever, e, substantially as herein described, whereby an opening between the said end of the breech block and the stock is avoided.

47,089.—Railroad Switch.—J. W. Colwell, Macedonia, Ohio:

First, I claim the guards, C C' d d', and guard rails, D D', in combination with the switch rails, when arranged as and for the purpose set forth.

Second, I claim placing the main track, A A', on a tangent with and at the junction of the side track, B B, in combination with the guards and guard rails, substantially as and for the purpose specified.

47,090.—Harrow and Roller Combined.—Wm. H. Converse, New Castle, Maine:

I claim the harrow, E, fitted in or to the frame, A, substantially as shown, in combination with the bent bar, F, provided with the plate.

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G, and a rear part, g, having a relative position with the harrow teeth, c, as described, the sides, f f of F, being fitted loosely on the harrow shaft, D, and bar, F, and harrow, E, connected by a spring, H, the above parts being applied to the frame, A, of a roller, C, and all arranged to operate substantially as set forth.

[This invention consists in combining a harrow with a roller and arranging the former in such a manner that it may be readily cleaned from weeds and trash which may engage or become entangled in its teeth, and also be capable of yielding to conform to the irregularities of surface over which it may pass.]

47,091.—Railroad Car Brake.—David T. Cross, Cincinnati, Ohio:

I claim the self-acting pawl, K, and its described or equivalent accessories, for the object set forth.

47,092.—Trunk Stay.—John M. Dailey, New York City:

I claim the use of one or more curved bars or plates moving upon suitable guiding pins in the cover and body of a trunk or other case, arranged and operating substantially as herein described and for the purpose specified.

Second, The combination with an ordinary hinge of the curved bar, h, arranged together and operating substantially as and for the purpose specified.

[This invention relates more particularly to traveling trunks, and consists in a peculiar combination of the hinge and stays, whereby they serve not only as clamps for strengthening the corners of the trunk, but also afford much more reliable holding stays for the trunk cover when open than the ordinary ones hitherto employed.]

47,093.—School Seat and Desk.—Wm. Disbrow, San Francisco, Cal.:

I claim the arrangement of the grooved bars, K, and sliding seat, M, with the standards, E, and desk, A, in the manner herein shown and described.]

[The object of this improvement is to facilitate the adjustment of the length and inclination of school desks, so that such furniture may be readily changed to suit the wants of pupils, enabling them to preserve the best bodily positions for health, etc. This is one of the best inventions of the kind that has come to our notice.]

47.094.—Desulphurizing Ores.—M. B. Dodge, New York City:

I claim mixing the ore and salt in a dry state and afterward steaming them within a close vessel in a perforated bottom.

[This invention consists in treating auriferous or argentiferous ore after it has been stamped with steam and common salt, in such a manner that the salt is equally diffused throughout the entire mass, and when the mixture is put into the desulphurizing furnace the full benefit of the salt is obtained, and the sulphur is effectually separated.]

47,095.—Pump Piston.—Wm. Foster Dodge, New York City:

First, I claim the expanding band, D, in combination with the shell, A, having a series of openings through which the pressure of the column of water or other fluid acts against the interior of the said band, substantially as and for the purpose herein specified.

Second, A piston, composed of a hollow shell, A, having openings, a a, in its sides and a valve seat and valve at or near its bottom, and a surrounding band of leather or other soft elastic or flexible material confined to the said shell between the said openings, by means of rings, c c, the whole combined substantially as and for the purpose herein specified.

47,096.—Protector for Baskets.—Philip Eley, New York City:

I claim a metallic frame, adjustable or otherwise, applied to baskets, in the manner substantially as and for the purpose herein set forth.

47,097.—Screw Steam Valve Cock.—Samuel D. Fales, Central Falls, Smithfield, R. I.:

I claim constructing the valve and valve seat for a steam or water valve cock in the manner substantially as described, for the purposes specified.

47,098.—Railroad Draft Bar.—Remy Fiegel, Montgomery County, Pa.:

I claim the boxes, A A', springs, B B' B' B' B', rod, C, bolt, F, and shackle, G, in combination with a buffer, E, rigidly fixed to the platform of a car, the whole being constructed, arranged and applied so as to operate together, substantially as described and set forth, for the purposes specified.

47,099.—Remedy for Disease in Trees.—Henry Furnel, Huntington, N. Y.:

I claim the combination of the herein-before mentioned ingredients, for the purpose set forth, substantially in the proportions described.

47,100.—Mode of Rendering Wick Incombustible.—E. P. Furlong and E. M. Lang, Westbrook, Maine:

We claim a wick rendered incombustible by saturation or coating, substantially as described.

Second, Saturating or coating a wick to prevent its combustion, substantially as described.

Third, Rendering a wick incumbustible by saturation in plumbago or its equivalents, as described.

47,101.—Silvering Glass Pitchers.—John W. Haines, Somerville, Mass.:—

I claim the dropping on of the hot glass on the outside rim of the pitcher, and by means of suction with the mouth expanding the solid piece of hot glass into oval shape, producing two copartments, as above described.

47,102.—Screw Driver and Tweezers.—D. Frank Hartford, Boston, Mass.:

First, I claim the wires, k k, and pin, j, or their equivalents, in combination with the tweezers and screw driver, substantially as and for the purpose described.

Second, Throwing the points of the tweezers beyond the point of the screw driver, by means of the spring, etc., substantially as set forth and for the purpose described.

Third, The spring lever, l, to operate substantially as described in combination with the tweezers, the indentation, n, and shoulder, m, for the purpose described.

47,103.—Machine for Cleaning Sheet Iron.—Edmund A. Harvey, Wilmington, Del.:

First, I claim cleansing sheets of metal by scrubbing and washing them and preventing them being oxydized thereby, by immediately afterward subjecting said sheets to heat, and thus causing all moisture to be evaporated from their surfaces, substantially as described.

Second the combination of the squeezing rollers, E E, and a heater for quickly drying the sheets, substantially as described.

Third, The rotary brushes, C C, in combination with the reciprocating brushes, D D, and feed rollers, all arranged, substantially as and for the purpose specified.

Fourth, The water tubes, H, in connection with the brushes and feed rollers, arranged to operate, as set forth.

Fifth, The heater, I, when used in combination with the brushes and feed rollers, and arranged to operate in connection therewith, for the purpose described.

47,104.—Screw Windlass and Capstan.—Henry Heitman, Brooklyn, N. Y., and John Radican, New York:

First, We claim the gear wheels, V V, applied in combination with the gear wheel, D, worm wheels, L L, captan, E, and windlass, I I, substantially in the manner as herein set forth, so that the capstan can be readily connected or disconnected from the windlasses, and a more or less powerful force can be exerted, according to the work to be accomplished.

Second, The combination of the capstan, barrel, E, pawls, G G G, and toothed wheel, D, with pawls, F F, and with stationary locks in the bedplate, B, substantially as described, so that by a simple change of the pawls, F and G, the capstan barrel can be used independently or in connection with the parts to which motion is imparted by the gear wheel, D.

47,105.—Cultivator.—George F. Hassenpflug and George Barnhart, Green Township, Ohio:

We claim the frame, a c, when constructed as described in combination with the plow standards, b b b b, the same being attached, as specified.

47,107.—Manufacture of Sweat Proof Paper Collar.—James H. Hoffman, New York:

I claim the manufacture of sweat proof paper collar, with the composition, substantially as described, applied in the manner substantially set forth.

47,108.—Car Coupling.—Edward P. Howland, Worcester, Mass.:

I claim the drop bar, B, made in shape substantially as herein described, having a pin, c, and shoulder, o, near its lower end, and when part of the same is made with wrought iron, with metal cast around it, substantially as and for the purpose set forth.

47,109.—Governor.—W. F. Keeler, La Salle, Ind.:

First, I claim combining with the balls and connecting arm of an ordinary governor for regulating and measuring the speed of a steam engine or other machine a column of mercury, k, resting upon a disk or movable bottom in the case in which the mercury is inclosed, substantially as above described.

Second, I also claim the combination of the mercury gauge, O, with the closed case, G, the movable disk, I, and the shaft, B, substantially as above described.

Third, I also claim the combination of the movable disk, I, and shaft, B, with the closed case, G, for containing mercury, substantially as described.

Fourth, I also claim balancing or controlling the centrifugal force of the balls or other rotating apparatus of a governor for regulating speed in machinery by means of the weight of a column of mercury rising within a gage, O, upon the stationary frame, as herein described.

[This invention consists in a governor to regulate speed and indicate speed attained, wherein a column of mercury is employed to restore the moving parts to their normal condition, and to measure the speed or power attained by the machinery to which the governor is attached.]

47,110.—Melodeons.—William Kinnard and J. B. Dreher, Cleveland, Ohio.

We claim First, Hanging the door or panel to the case in combination with the treadles, substantially as and for the purpose described.

Second. We claim the arm, G, and rod, H, in combination with the levers, I and J, and swell, substantially as and for the purpose described.

Third, We claim the hinged panel, A, treadles, B, in combination with the arm, G, rod, H, and levers, I J, substantially as and for the purpose described.

47,111.—Stove Pipe Damper.—Hiram Kipe, Thornbury, Pa.:

I claim combining with an ordinary stove pipe a wind wheel, T, a spindle, d, and ball governor, Q, for operating a throttle valve, V, substantially as above described.

[The object of this invention is to provide an automatic valve arrangement for use in stove pipes for domestic use more especially, and it consists in the application within the pipe of a wind wheel which operates the valve through an ordinary ball governor.]

47,112.—Mattress.—Robert Krause, New York:

I claim the application of a movable partial frame, adjusted by a screw and held in position by spring tongues, to any common mattress frame and spring bottom, by means of which frame, screw and spring tongues any spring bed mattress can be turned into a comfortable bed without the aid of cushions and pillows, as here described.

47,113.—Manufacture of Bolts.—William J. Lewis, Pittsburgh, Pa.:

I claim making bolts with square necks from old iron, by first staving up or enlarging that part of the rod intended for the neck previous to the formation of the square, and subsequently squaring that part by compression or otherwise, without regard to the nature of the tools used for that purpose.

47,114.—Roller Cleat for Trunks.—John A. Lieb and John Schmadel, Newark, N. J.:

We claim, as an improved article of manufacture, the trunk cleat, A, provided with rollers, b b, inserted in mortises, a a, all as herein specified.

47,115.—Heel and Toe Plate for Boots and Shoes.—Ira E. Loughborough, Pittsford, N. Y.:

I claim the external plate, b, when provided with projecting lips, c, and points, e, it being secured to the boot by the clamping lift or lifts, f, which are nailed on within the encircling rim of the plate, the edge of the lifts being entirely protected from wear by the said rim or flange.

47,116.—Watches.—G. C. Marten, Cleveland, Ohio.:

I claim a main spring barrel constructed of an outer barrel, B and an inner barrel, C, which are provided with stops, d e, and combined with the main spring, winding arbor and retaining power, in the manner and for the purpose substantially as herein set forth.

47,117.—Furniture Caster.—W. T. Mersreau, Newark, N. J.:

First, I claim the ball or roller, B, provided with the journals, b, when the same shall be constructed as shown, for the purpose specified.

Second, In combination with the same, I claim the base, A, ring, C, and collars, d d2, when the same shall be combined substantially as shown, for the purpose set forth.

47,118.—Boiler Furnace.—J. A. Miller, New York:

First, I claim the slits or openings, a a, in combination with the horizontal passages, E, in the side walls of the fire chamber, and with the ducts, D, in communication with the ash pit, substantially as and for the purpose herein specified.

Second, Giving the openings, a a, an inward horizontal inclination toward the bridge wall or rear of the fire chamber, substantially as and for the purpose herein specified.

Third, The pier, G, and side openings, c c, over the fire bridge, in combination with a system of stilts or openings, a a, for the admission of air through the side walls of the fire chamber, substantially as and for the purpose herein specified.

Fourth, The laterally oblique arrangement of the perforations, g g, in the back or inner screen, I, of the fire door, substantially as and for the purpose herein specified.

Fifth, The hollow hinge, h i, in combination with one or more openings, m n, in the door or fire front, and with a pipe, j, for the introduction of air from a blowing apparatus, whereby a current or currents of cold air are discharged in thin sheets across the open doorway, substantially as and for the purpose herein specified.

47,119.—Manufacture of Packing for Pistons, etc.—Ivon B. Miller and Wm. H. Miller, Philadelphia, Pa.:

We claim, First, The application of dry powdered substances to the fibrous material for the manufacture of packing in the manner above described, or any other substantially the same, and which will produce the intended effect.

Second, We claim the fibrous braided cover as applied to packing, in the manner and for the purpose above described, or any other substantially the same, and which will produce the intended effect.

Third, We claim the application of powdered substance to the fiber before it is made into yarn, as above described, or any other substantially the same, and which will produce the intended effect.

Fourth, We claim the use of the cover made of one kind of fiber and the inside or filling made of another kind, without the use of powdered substance, as above described, or any other substantially the same, which will produce the intended effect.

47,120.—Construction of Albums.—John D. Mets, Dubuque, Iowa:

I claim connecting together the leaves of books by means of strips of leather, cloth, or the equivalents thereof, applied substantially as described.

47,121.—Mode of Taking Casts from the Face of Living Persons.—Clark Mills, Washington, D. C.:

I claim the mode of process herein described.

47,122.—Valves for Steam Engines.—Albert Morton, South New Market, N. H.

I claim the use of two port covers, C C', one at each end of the valve and connected together by a rod or rods or their equivalents in combination with the crosshead, D, and regulating rod, g, constructed and operating substantially as and for the purpose set forth

[This invention consists in the use of two port covers one at each end of the valve connected together by a rod or rods or their equivalents applied in combination with a crosshead and screw-rod, and valve in such a manner that by turning said screw-rod either by hand or by the action of the governor, the steam is cut off at any desired point or the speed of the engine is regulated automatically if desired in a simple and effective way.]

47,123.—Refrigerator.—Owen E. Mosher, New York City:

I claim the combination of the ice chamber, B, trough, C and water tank, D, when the said parts are constructed and arranged in the manner and for the purposes herein specified.

[This invention consists in applying a water tank to a refrigerator having an ice chamber fitted in it in such a manner that the water in the tank will be kept at a low temperature and the water drawn from the tank as required for use. The object of the invention is to obtain cool water from a refrigerator without using the waste water from the ice chamber which always has an unpleasant flavor.]

47,124.—Baling Press.—George C. Paine, San Francisco, Cal.:

I claim, first, The peculiar arrangement and construction of the double toggle levers connected with the follower, D, in combination with the chain or ropes, s s, pulley, H H, and friction rollers, g', whereby I am enabled to locate the shaft and wheel on the outside of the vertical press box for the purposes described.

Second, The levers, I N, and bars, n n, connected together and applied to the top, K, of the press box as shown, in combination with the catches, L L, all arranged substantially as and for the purpose herein set forth.

Third, The loops or catches, R R, applied to the shafts, p p, connected at their upper ends by the rod, q, and cranks, r r, and arranged relatively with the sides, O O, substantially as and for the purposes herein set forth.

Fourth, The connection of the pintles of the hinges of the side doors, O O, by means of the pulleys, P P, and cross chain, Q, substantially as and for the purpose specified.

47,125.—Apparatus for Refining and Distilling Petroleum.—James Perkins and Wm. H. Burnett, Newark, N. J.:

First, We claim the combination of the receivers, C and K, with the agitator, N, and sediment receiver, M, substantially in the manner and for the purposes described.

Second. We claim the combination of the parts, C E K N and O, substantially in the manner and for the purpose described.

Third, We claim the use of the exhaust pump, H and R, in combination with the distilling and condensing apparatus described substantially in the manner and for the purposes set forth.

47,126.—Feed Wheel as a substitute for Ratchets or Pawls.—O. C. Phelps, New York City:

I claim the combination of the shifting apparatus above described with said wheel and clutch as and for the purpose herein set forth.

47,127.—Percussion Cap-holder for Fire Arms.—Rufus S. Pickett, New Haven, Conn.:

First, I claim the combination of the ratchet-wheel with the endless belt and its forked stud, p, when the whole is constructed and fitted for use substantially as herein described.

Second, I claim the combination of the endless belt with the guide, m, and cup, l, when the whole is constructed, and fitted for use substantially as herein described.

47,128.—Harvesters.—Amos Rank, Salem, Ohio:

First, I claim the combination of a hinged platform with a guard, g, and guard levers, h h, when the rear ends of said levers are attached by a sliding connection to the platform substantially as described.

Second, The connecting of the bail or guard, g, at a fixed point to the divider boards of a platform in such a manner that while the bail is always connected to the platform the bearing point, i, of the bail always remains the same substantially as herein described.

Third, The arms, b b, applied at the ends of the guard, g, substantially as described.

47,129.—Churn.—John Rankin, New York City:

First, I claim the use or employment of a blower for forcing a blast of air into the churn box, substantially as described, in combination with two screw dashers arranged one above the other and so as to create a circulation of the cream, all as and for the purposes set forth herein before.

Second, I also claim the employment in combination of two screw dashers, one above the other, when one feeds from the middle toward each end, and the other feeds from each end toward the middle.

Third, I also claim the employment of the internal and external gears, j i, and pinions, f g, in combination with the friction rim disc, k, and friction pulley, m, of the blower shaft, the whole arranged and operating as specified.

47,130.—Steam Boiler.—Edwin Reynolds, Mansfield, Conn.:

I claim the arrangement and construction of a boiler substantially as described.

47,131.—Machine for Cutting Tobacco.—F. W. Ritterhoff, C. A. Colquitt and William Mulchahey, New York City:

We claim the slotted adjustable disk, L, in combination with the lever, K, ratchet wheel, J, screw rod I, and follower, H, constructed and operating substantially as and for the purpose described.

47,132.—Process for Preserving Wood.—Louis S. Robbins, New York City:

I claim the process herein described for preserving wood from mold and decay, the same consisting in first removing the surface moisture from the wood and then changing and saturating the same with hot oleaginous vapors and compounds substantially as herein described.

A so removing the surface moisture from wood by means of hot oleaginous vapors substantially as herein described.

47,133.—Oil Well Pump.—John B. Root, New York City:

I claim, first, the employment, in an oil well, of an additional tube so arranged and applied in combination with the oil tube and an exhausting pump, that while it permits the exclusion of water from the lower part of the well by means of the seed bag, it provides for the escape of the gases from the well, substantially as herein described.

Second, The arrangement of the tube, C, surrounding and connected with the upper part of the well substantially as herein described, whereby the oil tube and oil pump may be removed without disturbing the seed bag.

46,134.—Churn.—Sarah E. Saul, New York City:

First, I claim the laterally sliding covers, C C, in combination with the dasher shaft as and for the purpose herein shown and described.

I also claim the hand rest, F, in combination with the crank, E, substantially as and for the purpose herein shown and described.

[This invention relates to a new and improved churn of that class in which a rotary dasher is employed, and it consists in a dasher of such construction in connection with sliding covers, and also in connection with an angular cream box or receptacle; and further in the employment of a hand rest with a crank, whereby it is believed that several advantages are obtained over ordinary churns of the class specified.]

47,135.—Clasps for Clothing.—Chandler Seaver, Boston, Mass.:

I claim my improved clothes fastener attachment, the same consisting of the plates, a and d, and the stud, f, they being constructed and to operate in connection with an eyelet or hole in the outer lap of the garment substantially in the manner as herein before explained.

47,136.—Base Burning Stove.—S. B. Sexton, Baltimore, Md.:

First, I claim a base burning stove which is so constructed that the gas which is generated in the coal supply cylinder, C, can be conducted off through the top plate of said cylinder and around the feed opening at pleasure substantially as herein described.

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Second, A chamber, D, with a valvular bottom and escape pipe, d, arranged over the coal supply cylinder or magazine of a base burning stove substantially as described.

Third, The draft flues, c c, when carried out of the top of the chamber. B, and conducted into a chamber, a, having an ascending flue leading out of it substantially as described.

Fourth, The combination in a base burning stove of the projecting ledge, h, formed on the lower edge of the opening, through case, F, and a flanch, i, projecting from the base rim of the cylinder surrounding the chamber, B, substantially as described.

Fifth, The application of a supplemental grate, S, to the magazine of a base burning stove substantially as described.

47,137.—Manufacture of Propellers.—James Sutherland, New York City:

I claim constructing a propeller out of two parts by forming the hub of each part substantially as herein shown and described and fitting the two parts together as and for the purposes set forth.

[This invention consists in constructing the propeller in two parts y so forming the hubs of each half that the cams fit together and form a perfect hub and propeller wheel, thus allowing the wheel to be forged of wrought iron and producing a propeller of superior strength, lightness and durability.]

47,138.—Machine for Distributing Fertilizers.—J. H. Thomas and P. P. Mast, Springfield, Ohio:

First, We claim the slats or strips, C, suspended from the bar, B, and projecting down through the opening in the bottom of the hopper, A, when connected at the bottom by bar, d, substantially as and for the purposes set forth.

Second, The shafts, C, provided with the projections, a and e, as and for the purpose described.

Third, The slats, C, as arranged in combination with the bar, D, and bottom pieces, F and F', as and for the purpose set forth.

47,139.—Device for Raising and Lowering Lock Gates.—William Thomas, Ottawa, Ill.:

I claim the combination of the block and tackle, the roller levers, ratchet wheels, the pawls, the springs and frame of the machine being operated and used as herein before set forth for the uses and purposes aforesaid.

47,140.—Medical Compound.—John Thurmon, Pike County, Mo.:

I claim the medical compound prepared as described.

47,141.—Insulator for Telegraph.—S. F. Van Choate, New York City:

I claim, first, the combination of the cavity, A, face plate, D, and pin hook, C, for the purposes set forth.

Second, The wooden bracket, B, plate, D, and hook, C, as above combined when coated with the composition as above, and for the purposes set forth.

47,142.—Addressing Machine.—N. E. Warren, Cleveland, Ohio, and G. W. Warren, Hillsdale, Mich.:

We claim, first, The curved lever, C C', operated by the bent spring, G, in combination with the adjustable head, D, when arranged and operating as herein set forth.

Second, We claim the pall, F', rock shaft, L', slotted rm, L'', and adjustable rod, J, in combination with the quod ratchet, i, operating as specified.

Third, We claim the adjustable head, D, with the faces, d d', arranged and operated as and for the purposes specified.

47,143.—Railway Carriage.—True West, Roxbury, Mass.:

I cl im the combination and arrangement of the four struts, E E E E, the four pendulous rods or hangers, F F F F, and the two semi elliptic springs, G G, disposed on each side of the truck frame, B, with the said frame, the axle boxes, C C, thereof, and the platform or carriage body, A, the whole being substantially as represented in Figure 1, of the drawings as herein before explained.

47,144.—Electro-magnetic Musical Instrument.—Lorenzo Wesson, Chillicothe, Ohio:

First, I claim an electro-magnetic apparatus for playing music with variable power or expression, by automatically varying the battery power exerted on the magnets to accord with the number of magnets in use or with the strength of sound required, in any manner, substantially as set forth.

Second, I claim a music board, B, provided with independent movable type, acting upon or constituting circuit breakers or circuit closers, to regulate or govern the tone, power or length of sounds produced by means of electro magnetism.

Third, I claim the key board, C, connected with a series of magnets, and constructed substantially as set forth, with two or more circuits, by which any of the said magnets may be put in action at will.

Fourth, In combination with the key board, C, and series of magnets, I claim the levers, G, plates, I, and wires, J, all arranged as described, and adapted to operate substantially as and for the purpose set forth.

Fifth, In combination with the electro magnets, E E' E2, music board, B, and additional battery, F', I claim the lever, G', operating substantially as described, to open communication between the additional battery and magnets, when required.

47,145.—Churn.—Henry P. Westcott, Seneca Falls, N. Y.:

I claim, First, The employment, in combination with the arm, E, lever, D, and arc, g, of a spring, f, substantially as and for the purpose set forth.

Second, I claim the use of a bellows, B, or its equivalent, in combination with the receiver and dasher shaft, in the manner and for the purpose substantially as set forth.

Third, I claim making the dasher adjustable, substantially as and for the purpose set forth, and,

Fourth, I claim the peculiar form of upper dash shown nd described, for the specific purposes set forth.

47,146.—Pump.—Joseph F. White, Keene, N. H.:

I claim the combination in a double-acting pump of a valve chest, W, provided with triangular valve chambers, A, with a rotating pump tube, carrying hollow radial arms, E, which have partial rotary motion, in horizontal directions, and are provided with double-acting valves, substantially as above described.

[This invention consists in a double-acting force pump, in which the pistons are made to extend radially from a hollow pump tube which rotates with the pistons.]

47,147.—Apparatus for Dividing Sugar in Blocks.—Wm. H. Whitmore, Boston, Mass.:

I claim the combination of the conduit, one or more saws, and the separators, arranged substantially in manner and so as to operate as specified.

47,148.—Oil Ejector.—George L. Witsel and Edward Burke, Philadelphia, Pa.:

We claim the combination of condensing and exhausting pumps, in conjunction with induction and eduction pipes, arranged within n oil well, substantially as and for the purposes described.

Second, Connecting both the exhausting engines to a lever, which receives a rapid vibrating motion, substantially as and for the purposes described.

47,149.—Bow Pin for Ox Yoke.—Orville O. Woodruff, Killingworth, Conn.:

I claim the combination of the two levers, A A, constructed with pins, D D, substantially as and so as to operate in the manner and for the purpose specified.

47,150.—Window Cord Pulley.—Wm. C. Ames, Hartford, Conn., assignor to Landers & Smith Manufacturing Co., New Britain, Conn.:

I claim as a new and improved article of manufacture, viz.: a window or sash cord pulley case, having the face plate, a, midway, or nearly so, of the case, a, to to be attached to the back side of the j mb casing of the window frame, substantially as described.

47,151.—Mode of Weaving Fabrics with Button Holes therein.—John Conner (assignor to himself and Henry A. Ayling), Boston, Mass.:

I claim the improvement in weaving suspender webbing, etc., to form button or other similar holes therein, by the employment of a reed having a construction, and operating in the manner substantially as set forth.

47,152.—Mangle.—Josee Johnson, New York City, assignor to John Ward, Jr., Brooklyn, N. Y. Antedated March 30, 1865:

I claim the combination and arrangement of the screw, Q, the spring, O, and the links, N, with the rollers, B' and B, and the frame, A, substantially as and for the purpose set forth.

47,153.—Seed Drill.—Griffith M. Murphy (assignor to Lyman S. Paine), Lewisburgh, Pa.:

I claim, First, A sliding or transferable spring, g, whereby the power required to throw the drill tube out of working position may, at the will of the operator, be increased or diminished, substantially as described.

Second, The arrangement of the lever, C, entirely above the drag bar, A, substantially as described.

Third, The combination of the drill tooth, B, drag b r, A, lever, C, and spring, C, substantially as described.

47,154.—Shaft Coupling for Carriage.—Francis B. Morse, New Haven, Conn., assignor to Frederick C. Dayton, Jr.,

I claim as a new article of manufacture a shaft coupling, composed of a jack or stationary part, forged with two eyes, and a cavity for retaining an elastic presser, an elastic presser, and a plain head with one eye, when constructed, combined and fitted for use, substantially as herein described.

47,155.—Forming Skeleton Skirt.—Datus E. Rugg, New York City, assignor to himself, F. S. Otis, Joseph I. and J. O. West, Jedediah Wilco & Co., and Henry Richardson:

I claim the method herein specified of shaping or forming ladies' skeleton skirts by sustaining the hoops in the proper position relatively, while being connected together by tapes, galloons, or their equivalents, for the purposes specified.

47,156.—Railway Car.—Signor Vallo (assignor to himself and Joseph Chapman), Philadelphia, Pa.:

I claim, First, Connecting the foot pieces, E E E E, with the springs, J, by means of the legs, F F F F, bars, G G, and spring seats, H H H H, substantially in the manner and for the purpose above described.

Second, Combining the spring seats, H H H H, with the bars, G G, by means of the pins, e e e e, on the inner edges of the said seats, and corresponding holes in the bars, G G.

Third, The combination and arrangement of the foot pieces, E E E E, with the legs, F F F F, by means of the hinges, a, and springs, a', substantially in the manner and for the purpose above described.

Fourth, Combining the rods, M M, with the foot pieces, E E E E, and guards, L L, to prevent the said foot pieces swinging forward by the motion of the cars, and also to allow them to be borne against the wheels at the proper time, substantially in the manner described and for the purpose set forth.

47,157.—Brush.—Albert M. White (assignor to himself and Barnard Larvey), Port Chester, N. Y.:

I claim the mode of securing the several bunches of bristles in the solid back of a brush, by means of separate staple like wires, C, applied substantially as herein described.

47,158.—Apparatus for Concentrating Liquids.—Chas. A. Wood, Dorchester, Mass., assignor to Daniel C. Hood, of the same place, and W. H. S. Jordon, West Roxbury, Mass.:

I claim as an improvement in vacuum pans the pan, A, in combination with a steam jacket, D, of wood or other non-conducting material, operating substantially as set forth, for the purpose specified.

I also claim an elastic packing for the joints of vacuum pans, operating substantially as described.

I also claim the within-described apparatus for conducting liquids, consisting essentially of the pan, A, with its jacket, D, packing, i, and dome, C, and the condenser, H I, the whole combined and operating substantially as set forth.

47,159.—Buckle.—Charles E. Woodman and Charles B. Hatfield (Assignors to Charles E. Woodman), Boston, Mass.:

We claim the combination and arrangement of the holding bar, b, and the straight-edged tongue, C, with the bar, a, the overlapping tongue, B, and the buckle frame, A.

We also claim the combination and arrangement of the compound or double tongue, C, and the bar, b, with the overlapping tongue, B, and the buckle frame.

We also claim the combination and arrangement of the compound or double tongue, C, the bar, b, or its equivalent, the bar, d, and the frame, A.

We also claim the combination and arrangement of the cross bar, d, with a single tongue and an overlapping tongue, and the buckle frame.

We also claim the construction of the overlapping tongue with a slot, or its equivalent arranged within it, substantially in manner and for the purpose set forth.

We also claim the combination of the connections, e e, with the two cross bars, a b, and the tongue, B, applied to them, the said bars and the buckle frame, as specified.

47,160.—Preparation of Materials to be Used in the Purification of Gas.—Alexander A. Croll, London, Eng.:

I claim, First, The combining the neutral salts referred to, or as nearly neutral as convenient, with wood, sawdust, or other slightly absorbent or cellular matter, in the manner stated, and employing such mixture in the purifying apparatus, for the purification of gas, substantially as described.

Second, I claim the use or application of the chloride or sulphate of manganese referred to with charcoal or wood sawdust, as a disinfectant

[This invention relates to combining neutral salts, or salts as nearly neutral as convenient, with wood, sawdust or other absorbent or cellular matter, and employing such mixture after it has been allowed to cool, for the purification of gas.]

47,161.—Cork Pull.—Frans Gustavus Bielefield, Berlin, Prussia, and Charles C. E. Schwartz, Hamburg:

We claim the combination of the rod, B, the metallic spring, C, and the button, D, substantially as and for the purpose specified.

47,162.—Drying and Charring Peat.—Fred'k Ludewig Hahn Danchell, London, Eng.:

I claim, First, The improved arrangement of the apparatus for drying blocks of peat, as shown and described in reference to sheet 1, and particularly the arrangement of the endless bands and rollers, by which the blocks are turned over in passing from one set to another.

Second, The arrangement and distribution of the air passages of the apparatus for drying peat.

Lastly, The application of a steam blast for producing the requisite currents of air for drying and charring peat or other carbonaceous substances

47,163.—Breech-Loading Fire Arms.—Cyprien Chabot, Philadelphia, Pa.:

I claim, in combination with the hinged breech block swinging upward and forward, the lever, H, and its latch hung thereto, but so as to have a degree of motion independent thereof, and the spring bolt, e, for the purpose of locking the breech block when down, and for unlocking it by the same motion that raises up again, as herein described and represented.

47,164.—Windlass for Tightening Ship's Standing Rigging.—Jasper G. Codmus, Port Richmond, N. Y.:

I claim the frame, d, suspended by the eye, e, from the rope or shroud to be tightened, in combination with the winch barrel, f, and a hand spike or lever to turn said winch barrel, as and for the purposes specified.

47,165.—Platform Scales.—James H. Conklin, Yorktown, N. Y.:

I claim the combination of the lever, A, with the other parts, C and F, of a scale, in the manner and for the purpose substantially as set forth.

47,166.—Steam Pressure Indicator.—W. M. Davie and Charles T. Webber, Janesville, Wis.:

We claim the arrangement of the scroll spring, e, the cylindrical box or chest, a, shaft, c, pulley, I, chain, K, connecting rod, d, cross bar, f, and hand wheel, g, substantially as and for the purposes set forth.

47,167.—Washing Machine.—John H. Duck and Erwin S. Gould, Elgin, Ill.

We claim the pinion, N, and wheel, T, in combination with the shaft, C, and rubbers, O' O' O'' O'', constructed and operated substantially in the manner and for the purpose described.

47,168.—Mining and Tunneling Machine.—Herman Haupt, Cambridge, Mass., and J. Y. Smith, Alexandria, Va.:

First, We claim the pick or series of picks in combination with a mechanism for imparting rotary motion thereto, to operate in the manner and for the purpose substantially as herein set forth.

Second, We claim the method herein described of mounting the pick or picks upon bevel gear disks, bevel gear and driving pinion being at or near the circumference of said disks, as set forth.

Third, We claim the bevel pointed picks, and the arrangement of the same upon the revolving disk, with the bevel faces alternatingly reversed, substantially as set forth.

Fourth, We claim the method of hanging the rotary pick disks in a swinging frame so arranged in relation to the gear mechanism as that a translatory movement may be imparted to picks without interfering with their rotation.

Fifth, In combination with the swinging frame and rotary picks, we claim the method herein described of adjusting or feeding the picks up to the work as the operation progresses independently of the main frame of the apparatus, substantially as set forth.

Sixth, We claim the combination with the rotary picks, held as described in a swinging frame, of a mechanism for laterally reciprocating the swinging frame, substantially as and for the purpose set forth.

Seventh, We claim the stationary cutter in front of the swinging frame, under or between the rotary picks, for the purpose of removing the core of the ore or coal, substantially as set forth.

Eighth, We claim locating within the swinging frame a shaft provided with pinions at either end thereof, and arranged in relation to the gear mechanism so as to receive from the prime mover and impart to the picks rotary movement, substantially as herein set forth.

47,169.—Beehives.—William Henschen, Hennepin Co., Minn.:

I claim the arrangement in the construction of a straw beehive of a straw rope, or layers of rope, with the splints, I, top frame, C, and and bottom frame, D, substantially as and for the purposes herein described.

47,170.—Lubricating the Packing of Stuffing Boxes, etc.—Ivon Bruce Miller and William Hartley Miller, Philadelphia, Pa.:

We claim the application of the substance, mode and material above described to the stuffing boxes or other joints of engines or other machinery, or any other substantially the same mode and material.

Second, We claim the application of the above material to other materials used for the manufacture of packing, as cotton and hemp saturated with it.

Third, We claim the application of above material, or any other substantially the same, to the rod or stuffing box, or to the packing thereof, by using it through the cylinder of the engine, or any other application thereof whereby the rod will carry the said material to the packing.

Fourth, We claim the substance above described as an adjunct to the various patent packings.

Fifth, We claim the mode and material above described, or any other substantially the same, and that will produce the intended effect, as a cover or coating in place of muslin or other material for rope packing, as applicable in the packing made of powdered and fibrous substance, for instance.

Sixth, We claim the above described material as applied to the packing of pistons of engines and pumps.

47,171.—Braiding Guide for Sewing Machines.—Louis Planer, New York:

I claim, First, Providing the groove, J, with a concave bottom, and a spring, L, to operate in the manner and for the purpose herein specified.

Second, The arrangement of the set screw, M, with spring, L, for regulating the pressure of the spring upon the braid in passing under the bottom of the groove, J, substantially as herein set forth.

47,172.—Ground Augur.—David Ring, Damariscotta, Me. Antedated March 26, 1865.

I claim, First, The disks, D and E, provided with the top and bottom cutters, h and j, substantially as set forth, and for the purpose described.

Second, Rendering the borer expansible by means of the oblong slots, f, substantially as described.

47,173.—Lamp for Burning Oil.—Thomas S. Speakman, Camden, N. J.:

I claim, First, The use, in combination with lamps for burning animal, vegetable or mineral oils or fatty matters, of a wick, or its equivalent, for conveying to the flame a supply of water substantially as and for the purpose herein set forth.

Second, The use of the heat of the flame for producing the aqueous vapor which is conveyed to the flame.

47,174.—Oil Ejector.—L. W. Turrell, Saml. Stanton and L. C. Ward, New York City:

We claim, First, A contrivance for raising oil like that hereinbefore described, that is to say, one wherein the oil is drawn up through a central passage or tube, around which is an annular passage or tube through which the compressed air is made to act upon the oil, substantially in the manner and for the purpose described.

Second, The manner of securing the internal tube, F, within the internal tube, A, by means of the perforated disk, E, and the coupling clamp, C, substantially as described.

Third, The manner of securing the tube, J, in its position by means of the disc, K, and coupling clamp, H, constructed and arranged substantially as described.

Fourth, The stuffing box, L, in combination with an internal and an external tube, arranged in the manner and for the purpose above described.

47,175.—Writing Tablet.—Thomas Weaver, Harrisburg, Pa.:

I claim, First, The construction of a tablet attachment for the hand that moves with it and under it, and presents a continuous writing surface under the pen or pencil, whose parts are so proportioned and arranged as to form, when folded, a pocket vade mecum.

Second, The combination and arrangement of the paper case, M X' N X, with the rells, M N, their driver, Q, the tablet leaf, L A, its bearing, O, its spring, A; also with the digital leaf, B K, its hinges, K K', its key hole, B, its stopper, B', for the ink bottom, B', situated in the hand side of paper case, substantially as and operating in the manner as herein described and set forth.

Third, The combination and joint operation of the metacarpal plates shown in Fig. 3, with each other, and with the digital leaf, B K, and with the carpal plates shown in Figs. 2 and 6, by means of the slot, F, the keyhole, E, the concave-convex slots, D D', their sliding clamps, 4 4, and the button, H, substantially as and operating in the manner as herein set forth and described.

Fourth, The combination and arrangement of the carpel plate, shown in Fig. 2, with the metacarpal plate shown in Fig. 3, by the buttons, T T'; also with the wrist by the hinged locking bracelet shown in Fig. 9, and the wrist band shown in Fig. 10, or with the plate shown in Fig. 6, which has the groove, J, the pad, P, the bands, a b, eyelets, 1 2 and 3, and buttons, U U', operating in the manner as and for the purposes herein set forth.

47,176.—Movable Fire-place with Gridiron Attachment.—S. W. Wetmore, Erie, Pa.:

I claim the movable fire-place, constructed with narrow sides, to be placed in the nature of a false door, in the doorway of the cooking stove, and to be used in connection with the adjustable folding grid iron suspended before it.

DESIGN.

2,041.—Show Case.—George Q. Pragnell, New York City:

I claim the design above described for the rails of a show case.

REISSUES.

1,926.—Shirt Collar.—Wm. E. Lockwood, Philadelphia, Pa., assignee by mesne assignments of Walter Hunt. Patented July 25, 1854:

I claim so indenting shirt collars made of a fabric composed of paper and muslin, or an equivalent fabric, that the indentations will represent the stitches of an ordinary dressed linen collar.

1,927.—Shirt Collar.—Wm. E. Lockwood, Philadelphia, Pa., assignee by mesne assignments of Walter Hunt. Patented July 25, 1854:

I claim a shirt collar made of a fabric composed of paper and

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muslin, or an equivalent fabric, having a smooth white surface coated with transparent varnish, for the purpose specified.

1,928.—Revolving Fire-arm.—Roilin White, Springfield, Mass. Patented April 13, 1858:

I claim in that class of arms consisting of a fixed barrel with a rotating cylinder having a series of parallel chambers, which are brought in succession in line with the barrel to be fired, making a recess or aperture through the breech, and communicating with, but of less area than the rear end of the chamber, and of a form, substantially as described, suited to and in combination with the hammer, or the equivalent thereof, to strike through such recess against the rear end of the cased cartridge which contains the fulminate priming, as set forth.

1,929.—Tobacco Pipe.—The Tobacco Pipe Company, Baltimore, Md., assignees by mesne assignment of Andrew J. Bowen. Patented June 10, 1862:

We claim, First, The two tubes or channels, a and b, in the stem, in combination with the bowl, c, and cup or receptacle, d, as herein set forth.

Second, The device by which the cup or receptacle, d, is attached to the bowl, c; i. e., the male screw in the latter and the female screw in the former, or their equivalents, in combination with the channels, a and b, bowl, c, and cup, d, substantially as shown and described and for the purposes set forth.

PATENTS

GRANTED

FOR SEVENTEEN YEARS.

MUNN & COMPANY,

In connection with the publication of the SCIENTIFIC AMERICAN, have acted as Solicitors and Attorneys for procuring "Letters Patent" for *new inventions* in the United States and in all foreign countries during the past *seventeen years*. Statistics show that nearly ONE-THIRD of all the applications made for patents in the United States are solicited through this office; while nearly THREE-FOURTHS of all the patents taken in foreign countries are procured through the same source. It is almost needless to add that, after *seventeen years'* experience in preparing specifications and drawings for the United States Patent Office, the proprietors of the SCIENTIFIC AMERICAN are perfectly conversant with the preparation of applications in the best manner, and the transaction of all business before the Patent Office; but they take pleasure in presenting the annexed testimonials from the three last ex-Commissioners of Patents.

MESSRS. MUNN & CO.:—I take pleasure in stating that, while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE CAME THROUGH YOUR HANDS. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the office, a marked degree of promptness, skill, and fidelity to the interests of your employers. Yours very truly,

CHAS. MASON.

Judge Mason was succeeded by that eminent patriot and statesman, Hon. Joseph Holt, whose administration of the Patent Office was so distinguished that, upon the death of Gov. Brown, he was appointed to the office of Postmaster-General of the United States. Soon after entering upon his new duties, in March, 1859, he addressed to us the following very gratifying letter.

MESSRS. MUNN & CO.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you discharged you duties as Solicitors of Patents, while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and I doubt not justly deserved) the reputation of energy, marked ability, and uncompromising fidelity in performing your professional engagements.

Very respectfully, your obedient servant,

J. HOLT.

Hon. Wm. D. Bishop, late Member of Congress from Connecticut, succeeded Mr. Holt as Commissioner of Patents. Upon resigning the office he wrote to us as follows:

MESSRS. MUNN & CO.:—It gives me much pleasure to say that, during the time of my holding the office of Commissioner of Patents, a very large proportion of the business of inventors before the Patent Office was transacted through your agency; and that I have ever found you faithful and devoted to the interests of your clients, as well as eminently qualified to perform the duties of Patent Attorneys with skill and accuracy. Very respectfully, your obedient servant,

WM. D BISHOP.

THE EXAMINATION OF INVENTIONS.

Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submit it to us, with a full description, for advice. The points of novelty are carefully examined, and a written reply, corresponding with the facts, is promptly sent, free of charge. Address MUNN & CO., No. 37 Park Row, New York.

As an evidence of the confidence reposed in their Agency by inventors throughout the country, Messrs. MUNN & CO. would state that they have acted as agents for more than TWENTY THOUSAND inventors! In fact, the publishers of this paper have become identified with the whole brotherhood of inventors and patentees, at home and abroad. Thousands of inventors for whom they have taken out patents have addressed to them most flattering testimonials for the services rendered them; and the wealth which has inured to the individuals whose patents were secured through this office, and afterwards illustrated in the SCIENTIFIC AMERICAN, would amount to many millions of dollars! Messrs. MUNN & CO. would state that they never had a more efficient corps of Draughtsmen and Specification Writers than those employed at present in their extensive offices, and that they are prepared to attend to patent business of all kinds in the quickest time and on the most liberal terms.

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The service which Messrs. MUNN & CO. render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there; but is an opinion based upon what knowledge they may acquire of a similar invention from the records in their Home Office. But for a fee of $5, accompanied with a model, or drawing and description, they have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a patent, &c., made up and mailed to the inventor, with a pamphlet, giving instructions for further proceedings. These preliminary examinations are made through the Branch Office of Messrs. MUNN & CO., corner of F and Seventh streets, Washington, by experienced and competent persons. Many thousands of such examinations have been made through this office, and it is a very wise course for every inventor to pursue Address MUNN & CO., No 37 Park Row, New York.

THE VALIDITY OF PATENTS.

Persons who are about purchasing patent property, or patentees who are about erecting extensive works for manufacturing under their patents, should have their claims examined carefully by competent attorneys, to see if they are not likely to infringe some existing patent, before making large investments. Written opinions on the validity of patents, after careful examination into the facts, can be had for a reasonable remuneration. The price for such services is always settled upon in advance, after knowing the nature of the invention and being informed of the points on which an opinion is solicited. For further particulars address MUNN & CO., No. 37 Park Row, New York.

The Patent Laws, enacted by Congress on the 2d of March, 1861 are now in full force, and prove to be of great benefit to all parties who are concerned in new inventions.

The law abolishes discrimination in fees required of foreigners, excepting natives of such countries as discriminate against citizens of the United States—thus allowing Austrian, French, Belgian, English, Russian, Spanish and all other foreigners, except the Canadians, to enjoy all the privileges of our patent system (except in cases of designs) on the above terms. Foreigners cannot secure their inventions by filing a caveat; to citizens only is this privilege accorded.

CAVEATS.

Persons desiring to file a caveat can have the papers prepared in the shortest time by sending a sketch and description of the invention. The Government fee for a caveat is $10. A pamphlet of advice regarding applications for patents and caveats is furnished gratis, on application by mail. Address MUNN & CO., No. 37 Park Row, New York.

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All persons having rejected cases which they desire to have prosecuted, are invited to correspond with MUNN & CO., on the subject giving a brief history of the case, inclosing the official letters, &c.

HOW TO MAKE AN APPLICATION FOR A PATENT.

Every applicant for a patent must furnish a model of his invention if susceptible of one; or, if the invention is a chemical production, he must furnish samples of the ingredients of which his composition consists, for the Patent Office. These should be securely packed, the inventor's name marked on them, and sent, with the Government fees, by express. The express charge should be pre-paid. Small models from a distance can often be sent cheaper by mail. The safest way to remit money is by a draft on New York, payable to the order of Messrs. MUNN & CO. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents; but, if not convenient to do so, there is but little risk in sending bank bills by mail, having the letter registered by the postmaster. Address MUNN & CO., No. 37 Park Row New York.

Patents are now granted for SEVENTEEN years, and the Government fee required on filing an application for a patent is $15. Other changes in the fees are also made as follows:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design.	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Re-issue	$30
On application for Extension of Patent	$50
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On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
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On filing application for Design (fourteen years)	$30

SEARCHES OF THE RECORDS.

Having access to all the official records at Washington, pertaining to the sale and transfer of patents, MESSRS. MUNN & CO., are at all times ready to make examinations as to titles, ownership, or assignments of patents. Fees moderate.

ASSIGNMENTS OF PATENTS.

The assignment of patents, and agreements between patentees and manufacturers, carefully prepared and placed upon the records at the Patent Office. Address MUNN & CO., at the Scientific American Patent Agency, No. 37 Park Row, New York.

FOREIGN PATENTS.

Messrs. MUNN & CO., are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business they have offices at Nos. 66 Chancery lane, London; 29 Boulevard St. Martin, Paris; and 26 Rue des Eperonniers, Brussels. They thing they can safely say that THREE-FOURTHS of all the European Patents secured to American citizens are procured through their agency.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

Circulars of information concerning the proper course to be pursued in obtaining patents in foreign countries through MUNN & CO'S Agency, the requirements of different Government Patent Offices, &c may be had, gratis, upon application at the principal office, No. 37 Park Row, New York, or any of the branch offices.

INVITATION TO INVENTORS.

Inventors who come to New York should not fail to pay a visit to the extensive offices of MUNN & CO. They will find a large collection of models (several hundred) of various inventions, which will afford them much interest. The whole establishment is one of great interest to inventors, and is undoubtedly the most spacious and best arranged in the world.

MUNN & CO. wish it to be distinctly understood that they do not speculate or traffic in patents, under any circumstances; but that they devote their whole time and energies to the interests of their clients.

COPIES OF PATENT CLAIMS.

MESSRS. MUNN & CO., having access to all the patents granted since the rebuilding of the Patent Office, after the fire of 1836, can furnish the claims of any patent granted since that date, for $1.

EXTENSION OF PATENTS.

Many valuable patents are annually expiring which might readily be extended, and if extended, might prove the source of wealth to their fortunate possessors. Messrs. MUNN & CO. are persuaded that very many patents are suffered to expire without any effort at extension, owing to want of proper information on the part of the patentees, their relatives or assigns, as to the law and the mode of procedure in order to obtain a renewed grant. Some of the most valuable grants now existing are *extended patents*. Patentees, or, if deceased, their heirs, may apply for the extension of patents, but should give ninety days' notice of their intention.

Patents may be extended and preliminary advice obtained, by consulting, or writing to, MUNN & CO., No. 37 Park Row, New York.

UNCLAIMED MODELS.

Parties sending models to this office on which they decide not to apply for Letters Patent and which they wish preserved, will please to order them returned as early as possible. We cannot engage to retain models more than one year after their receipt, owing to their vast accumulation, and our lack of storage room. Parties, therefore, who wish to preserve their models should order them returned within one year after sending them to us, to insure their obtaining them. In case an application has been made for a patent the model is in deposit at the Patent office, and cannot be withdrawn.

It would require many columns to detail all the ways in which the Inventor or Patentee may be served at our offices. We cordially invite all who have anything to do with patent property or inventions to call at our extensive offices, No. 37 Park Row, New York, where any questions regarding the rights of Patentees, will be cheerfully answered.

Communications and remittances by mail, and models by express (prepaid) should be addressed to MUNN & CO. No. 37 Park Row, New York.

Notes and Queries

Correspondents who wish information from us through this column must, as an evidence of good faith, sign their names to their letters. We throw aside all anonymous communications

W. C., of N. J.—We don't know what the "trap process" of tempering springs is. One way to temper them is to make them hard first and then draw the temper in hot sand heated to 550 or 570 degrees, at which temperature they are dark purple to blue. Oil or tallow smokes at 470 degrees, and takes fire when a light is presented. At 570 degrees it goes out when the light is withdrawn.

R. B. C., of Mass.—It is not new to make a ratchet drill with vertical teeth; such drills were made and sold fifteen years ago.

E. W. D., of Conn.—The wisest and the most learned men are always the most ready to admit their errors, while the greatest fools and ignoramuses are the ones to insist most strongly that they never make mistakes. In the case referred to, all that was said was that the boat with the pulley engine ran faster than the one with the crank engine, but you must know that it is very easy for interested parties to conduct such experiments so as to show any result they please.

T. W. D., of Cal.—Petroleum is composed of the same elements as India-rubber, viz.: hydrogen and carbon. It is probable that by the destructive distillation of India-rubber part of it might be converted into oil closely resembling some portions of petroleum, but we know of no fact that would suggest the possibility of converting petroleum into India-rubber.

Horace, of Pa.—To calculate the power of a steam engine multiply the area of the piston in inches by the pressure per inch in pounds, the product by the length of the stroke in feet, this product by the number of strokes in a minute, and divide by 33,000.

J. S., of N. S.—For cotton machinery of all kinds address Whiting & Sons, Northbridge, Mass.

Nassau, of N. J.—It is rather a complicated problem, but it seems to us that the oscillations must be continuous.

Critic, of R. I.—The earth in its rotation on its axis turns one degree in four minutes; bodies, therefore, at the equator are carried along about seventeen miles in a minute from west to east. Portions of the earth nearer the center are also moving around from west to east, but with less velocity. If a hole were made through the center of the earth at the equator and a stone were dropped into it the stone would continue its eastward motion at the rate of seventeen miles a minute till it came to portions of the earth moving in the same direction but with less velocity, when it would overtake them and strike the eastern side of the hole.

B. H. M., of N. H.—India-rubber varnish for cloth should be of vulcanized rubber.

L. W. S., of Mo.—You can procure a newspaper file suitable for the SCIENTIFIC AMERICAN from Alfred Goulding, Worcester, Mass.

J. P. V., of Cooksville.—Your improvement seems to be new, and we should think a patent could be obtained for it. In what State do you reside?

F. G. F., of Ohio.—You have the right spirit. An inventor can never succeed if he allow a single failure to discourage him.

J. S. E., of Wis.—We cannot admit to our columns a communication that prejudges a case that may involve litigation in court.

C. C., of D. C.—We cannot publish your letter, for the reason that it might prejudice the rights of the patentees in advance of a judicial decision. The patent must stand on its own merits, without any interference on our part.

J. S., of Ind.—We have credited you $1 on account of your subscription. The article to which you refer was prepared expressly for our paper or we should not have published it, as we dislike long communications. We do not think your proposed article on natural and mental philosophy would be acceptable.

J. W. H., of N. Y.— You can procure soluble glass of Lewis Feutchwanger, No. 55 Cedar street, this city. We believe the emery wheels made with it are rendered insoluble by having the least possible excess of alkali, so that hot water is required for the solution.

O. D. M., of N. H.—The sample which you send us we take to be very thin tin foil pasted upon paper.

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G. W. B., of N. Y.—The Avery engine should yield the full power of the steam (except that which is obtained by expansion), provided the arm at the point of exit moves with a velocity equal to that with which the steam flows through the orifice. This requires a long arm and a very rapid revolution. You can see an old Avery engine at a saw-mill in Attorney street in this city.

S. C. S., of C. W.—For general use in soldering gold rings you will find the following recipe valuable: Gold, 2; silver, 1; copper, 1. Stir it well, and add a little borax in powder; pour out in slips, which will make it handier to use. To clean gold which has been soldered heat it very hot; let it cool gradually, then boil in urine and sal ammoniac. A harder solder than the above is made of gold and silver.

I. H. D., of Mass.—The dispatch on the American line does not go to the Independent line, because the circuit is broken; there is no connection between them. We have never seen two rudders applied to one vessel in the manner you describe, and do not doubt its utility so far as increased action on the hull is concerned. Your hoisting arrangement through the aid of a hydraulic press would be too slow. No body could wait fifteen minutes to hoist a tun twenty feet. Your plans for iron-coating ships are not new; similar ones have been published in the SCIENTIFIC AMERICAN.

J. H. M., of Mo.—A man has no right to make a patented article for his family use without the inventor's consent.

U. S., of Md.—W. W. Secombe. No. 254 Broadway manufactures a very excellent hand-stamp canceller.

F. T., of Iowa.—If you have used your smokestack nine years and find it has now failed you have had good service from it and it has died of old age. The exhaust passing into it does not affect its durability, for whatever moisture resulted therefrom would be dried up almost instantly.

R. T. D., of Conn.—What you require is the terchloride of gold. A brass chain washed in this receives a golden deposit when dried.

J. T., of D. C.—You will find the information about the reporting machine on page 173, vol. XI.

T. A. H. C., of Mo.—A very useful book for you will be the Tinman's Manual and Builder's and Mechanic's hand book, by I. R. Butts & Co., Washington street, Boston, Mass.

Venango, of N. Y.—We understand that Professor Dana has a work in press on petroleum, and you will doubtless find that free from the absurdities and trivialities in the work of which you complain.

J. S., of Ill.—If you will send us a sample of the substance in your spring we will tell you whether it is petroleum. In these days the dreams of a great many people are running on oil wells.

J. W., of Mass.—No person except the owner of the patent right for a given state or territory has a right to make use of or sell the invention in such State.

A. G. W., of D. C.—We certainly did not mean to accuse you of plagiarism. We published your communication for the benefit of our large numbers of new subscribers, and we added the foot note principally to call your attention and that of other readers to our previous article.

NOTICE TO SUBSCRIBERS.

The first five numbers of the present volume of the SCIENTIFIC AMERICAN being out of print, we shall commence the time of each new subscriber from the date of receipt of the order, unless the writer states specifically that he wishes such back numbers as can be furnished.

SPECIAL NOTICE TO INVENTORS.

The money receipts on account of patent business, which have heretofore been published in this column, and the notification of cases sent to the Patent Office, will for the present be discontinued. The receipt of specifications and money from inventors will be acknowledged promptly by mail.

TO OUR READERS.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known, and enclosing $1 as fee for copying. We can also furnish a sketch of any patented machine issued since 1853, to accompany the claim, on receipt of $2. Address MUNN & CO., Patent Solicitors, No. 37 Park Row, New York.

RECEIPTS.—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona-fide* acknowledgement of our receipt on their funds.

MODELS are required to accompany applications for Patents under the new law, the same as formerly, except on design patents, when two good drawings are all that are required to accompany the petition, specification and oath, except the Government fee.

INVARIABLE RULE.—It is an established rule of this office to stop sending the paper when the time for which it was pre-paid has expired.

Back Numbers and Volumes of the "Scientific American."

VOLUME IV., AND VOLUME XI., (NEW SERIES) complete (bound) may be had at this office and from periodical dealers. Price, bound, $3 00 per volume, by mail, $3 75 which includes postage. Every mechanic, inventor or artisan in the United States should have a complete set of this publication for reference. Subscribers should not fail to preserve their numbers for binding. VOLS. I., II., III., V., VI., VII., VIII., IX. and X., are out of print and cannot be supplied.

RATES OF ADVERTISING.

TWENTY-FIVE CENTS per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published we will explain that eight words average one line. Engravings will not be admitted into our advertising columns, and, as heretofore, the publishers reserve to themselves the right to reject any advertisement they may deem objectionable.

IMPROVED FURNACE—PATENTED JANUARY 3, 1865.—This is an invention of high importance to Engineers, Petroleum Distillers, Sorghum Manufacturers, Salt Evaporators, Etc., and is destined to create a revolution in the arrangement of furnace fires under long boilers and evaporators of any kind.

This furnace is made to extend in continuous sections under long boilers or evaporators to any desired length; the grate being also in sections resting on wheels set in a ledge on each side of the furnace, and each grate is raised and lowered at pleasure to apply more or less heat to the pan or boiler.

When the heat is too great, the draught is shut off in front; when it is about right, the chimney stopper is closed, and the heat all retained; as the boiling slackens, the grates are raised one or all, less or more, nearer to the pan; as the fire deadens, the draught is let on, and so continued.

When either grate wants more coal, it is drawn out, supplied, and returned to its place in one minute or less, and the places of any two of them can be exchanged quite as quickly.

When the furnace is too long for the grates to be run in and out with a hook, it is done by an endless chain.

The furnace is always inclosed by walls, which support the pan or boiler above it, except an extra section, which extends out front of the doors, where the fires are all made.

Fires arranged on this plan can be immediately withdrawn in case of the water getting too low in the boiler.

To Sorghum Manufacturers it must be invaluable, from the facility it affords for economizing the heat, modifying, regulating and varying it under different parts of the pan, as desired.

No part of the furnace is exposed to injury from heat but the grates.

Explicit directions given for making and setting a furnace; they can be cast and fitted, boxed and shipped to any point.

The inventor being a confirmed invalid, is disposed to sell out his whole patent to some party more able to introduce it, and will assist in procuring foreign patents. Address

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A CHALLENGE.—WE OFFER FOR SALE A NEW No-Chimney Kerosene Oil Burner, that gives a most brilliant light, without smoke or odor, that cannot be extinguished by sudden motion. We challenge the world to produce its equal. Send fifty cents and get a sample by return of mail.
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THE ADVERTISER, WHO HAS HAD A LENGTHY business experience, purposes shortly to visit the cities of Europe, and will assume charge of the introduction of a few American manufactures—patent rights, etc., which may be entrusted to him. Communications, stating particulars and address, may be addressed J. M. F., Box 1232, P. O., New York. 15 2

HORSE-SHOES.—JOHNSON'S PATENT HORSE-SHOES attached to the hoof without nails are the best shoes for an interfering or cutting horse. Illustrated in SCIENTIFIC AMERICAN, Vol. XII., No. 14. For particulars address JOHN M. JOHNSON, Station D, New York. A mistake occurred in the engraving of Fig. 2 15 2*

THE UNION MOLDING MACHINE—BEST IN USE.—For circulars address H. A. LEE, patentee, Worcester, Mass. 15 4*

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No charge is made for the publication, and the cuts are furnished to the party for whom they are executed as soon as they have been used. We wish it understood, however, that no second-hand or poor engravings, such as patentees often get executed by inexperienced artists for printing circulars and handbills from, can be admitted into these pages. We also reserve the right to accept or reject such subjects as are presented for publication. It is not our desire to receive orders for engraving and publishing any but good Inventions or Machines, and such as do not meet our approbation in this respect, we shall decline to publish.

For further particulars address—

MUNN & CO.,
Publishers of the SCIENTIFIC AMERICAN.
No. 37 Park Row, New York City

OFFICE A. A. PROVOST-MARSHAL-GENERAL,
AND SUP'T VOLUNTEER RECRUITING SERVICE SOUTHERN
DIVISION OF NEW YORK, NEW YORK, March 20, 1865.

THE FOLLOWING CIRCULAR IS PUBLISHED FOR the information of those concerned.

RICHARD I. DODGE, Major 12th Infantry, A. A. P. M. General.

WAR DEPARTMENT. PROVOST-MARSHAL-GENERAL'S
OFFICE, WASHINGTON, D. C., March 11, 1865.

CIRCULAR No. 6.—In conformity with the proclamation of the President herewith published, all officers and employees of this Bureau are instructed to give prompt attention to the receiving and forwarding of such deserters as present themselves in accordance with its provisions.

"BY THE PRESIDENT OF THE UNITED STATES OF AMERICA:
"A PROCLAMATION.

"Whereas the twenty-first section of the act of Congress, approved on the third instant, entitled 'An act to amend the several acts heretofore passed to provide for the enrolling and calling out the national forces, and for other purposes,' requires, 'that in addition to the other lawful penalties of the crime of desertion from the military or naval service, all persons who have deserted the military or naval service of the United States who shall not return to said service, or report themselves to a Provost-Marshal within sixty days after the proclamation hereinafter mentioned, shall be deemed and taken to have voluntarily relinquished and forfeited their rights of citizenship and their rights to become citizens, and such deserters shall be forever incapable of holding any office of trust or profit under the United States, or of exercising any rights of citizens thereof; and all persons who shall hereafter desert the military or naval service, and all persons who, being duly enrolled, shall depart the jurisdiction of the district in which he is enrolled, or go beyond the limits of the United States with intent to avoid any draft into the military or naval service, duly ordered, shall be liable to the penalties of this section. And the President is hereby authorized and required forthwith, on the passage of this act, to issue his proclamation setting forth the provisions of this section, in which Proclamation the President is requested to notify all deserters returning within sixty days, as aforesaid, that they shall be pardoned on condition of returning to their regiments and companies, or to such other organizations as they may be assigned to, and serve the remainder of their original terms of enlistment, and, in addition thereto, a period equal to the time lost by desertion.

"Now, therefore, be it known that I, ABRAHAM LINCOLN, President of the United States, do issue this my Proclamation, as required by said act, ordering and requiring all deserters to return to their proper posts; and I do hereby notify them that all deserters who shall, within sixty days from the date of this Proclamation, viz: on or before the 10th of May, 1865, return to service, or report themselves to a Provost-Marshal, shall be pardoned, on condition that they return to their regiments and companies, or to such other organizations as they may be assigned to, and serve the remainder of their original terms of enlistment, and, in addition thereto, a period equal to the time lost by desertion.

"In testimony whereof, I have hereunto set my hand, and caused the seal of the United States to be affixed.

"Done at the City of Washington, this eleventh day of March, in the year of our Lord one thousand eight hundred and sixty-
[L. S.] five, and of the independence of the United States, the eighty-ninth.

"ABRAHAM LINCOLN.

"By the President: WILLIAM H. SEWARD, Secretary of State."

The records and returns of these deserters will be made up in the same manner as is provided for in other cases by existing regulations, except that it will be noted on the book of deserters arrested, opposite the name of deserter, the fact of his having voluntarily surrendered himself in conformity with the President's Proclamation; and the numbers thus surrendering themselves to be separately stated on the report to this office.

The Secretary of War directs that no reward be paid for the arrest of deserters who may be arrested subsequent to the receipt of this order by the District Provost-Marshals.

14 3t JAMES B. FRY, Provost Marshal-General.

CHIEF QUARTERMASTER'S OFFICE,
No. 1139 Girard street, Philadelphia Depot, March 31, 1865.

SEALED PROPOSALS WILL BE RECEIVED AT at this office till MONDAY, April 10, 1865, at 12 o'clock M., for delivery at the Schuylkill Arsenal, in merchantable packages (cases to be made to conform to specifications at this office),

3-4 Canton Flannel for Drawers, army standard.
Stockings, do.
Pegged Boots for Cavalry, do.
Pegged Bootees for Infantry, do.
Hospital Tents and Flies, do.
Forage Caps, do.

Samples of the standard articles required may be seen at this office.

Parties offering goods should make separate proposals for each article offered, and must distinctly state in their bids when they will commence their deliveries, the quantity they propose to furnish each week, the price (*which should be written both in words and figures*), and conform to the terms of this advertisement, *a copy of which should accompany each proposal.*

Bids will be opened on Monday, April 10, 1865, at 12 o'clock M., and bidders are requested to be present.

Each bid must be guaranteed by two responsible persons, whose signatures must be appended to the guaranty, and certified to as being good and sufficient security for the amount involved, by some public functionary of the United States.

All proposals should be made out on the regular forms, which will be furnished on application at this office.

The right is reserved to reject any bid deemed unreasonable, and no bid from a defaulting contractor will be received.

Indorse envelope, "Proposals for (here insert the name of the article offered)," and address

Colonel WILLIAM W. MCKIM, Chief Quartermaster,
15 2 Philadelphia Depot.

PAGE'S PATENT PERPETUAL DRAW BRICK AND Limekiln. Brickkiln will burn 40,000 No. 1 Brick per day, with four cords of wood or two tuns of soft coal. Limekiln will burn 300 bushels with three cords of wood or two tuns of coal. Address C. D. PAGE, Rochester, N. Y. 12 8*

INCRUSTATION.—WINANS' POWDER REMOVES and prevents scale—a certain remedy at trifling cost: beware of imitations. References everywhere. H. N. WINANS, N. Y. 15 4*

PLATINA—WHOLESALE AND RETAIL—FOR ALL purposes. H. M. RAYNOR, Importer, No. 748 Broadway, New York. Platinum Scrap of any sort purchased. 15 4*

WANTED—TO CORRESPOND WITH SOME PERSON or Manufacturer who has for sale or manufactures Riveting machines, which can be used to make rivets from 3 16ths to 8-8th inch. Address R. H. W., P. O. Box 132, Reading, Pa. 12

ASSISTANT QUARTERMASTER'S OFFICE,
No. 451 EIGHTH AVENUE, NEW YORK, March 9, 1865.

CAVALRY AND ARTILLERY HORSES WANTED.—I will purchase in open market all horses that may be presented and pass inspection at the Government stables on Thirty-fifth street, near Tenth avenue, until further notice, as follows:—

Cavalry horses, 5 to 10 years old, 15 to 16 hands high.

Artillery horses, 6 to 10 years old, 15½ hands high, and over 1,100 pounds, and dark color.

Price for cavalry horses, $175. Price for artillery horses, $180. Payable in such funds as may be furnished by the Government.

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HANCOCK'S PATENT STEAM BLOWER COMBINES all the advantages of the Fan Blower, and requires very little power to operate it. It is noiseless, occupies no space available for other purposes, requires no connection with any motor other than a boiler, and the steam used to produce the blast is utilized in the furnace to promote combustion.

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FOR PATENT STAVE AND BARREL MACHINERY Shingle Machines, Etc., address J. A. FAY & CO.,
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A step ladder would seem to be the last thing to improve or modify so as to radically change its construction, and it is a good proof of the versatility of inventors that they have taken this simple thing in hand and greatly improved it.

This step ladder is much lighter than the old-fashioned affair, and at the same time much stronger. The one here illustrated will safely bear the weight of three men.

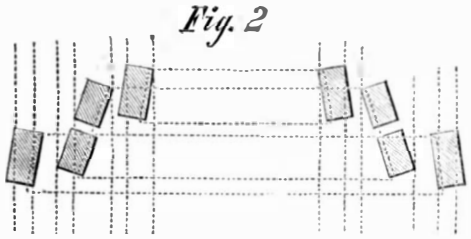
By referring to the engraving the reader will see that the sides or main supports of the steps are bow-

Fig. 1

BOND'S STEP LADDER.

shaped. They are also twisted on the inner side, so that great rigidity is given with less material. This twist is obtained by cutting the steps at varying angles, so that the desired curve is secured. A section of this ladder will appear as shown in Fig. 2, the different blocks or squares representing the parts as they appear when cut through the middle vertically. For gardeners or in stores, in fact in all places where

Fig. 2



such ladders are used, this one will be found convenient. It was patented on the 5th of April, 1864, by W. E. Bond, of Cleveland, Ohio; for further information address as above. State and county rights for sale.

A Rare Mineral.

The Reese River *Reveille* of 1st March, says:—

We saw lately, taken from the Warner and Wells lode by the Perseverance Company, a specimen of crystalized ruby silver ore that for beauty and rarity was a gem seldom equaled. The specimen consisted of a mass of crystals of some dozen or more, weighing about four ounces, of pure ore of the general class of antimonial sulphuret specified by Blake as "pyrargyrite." He says of it: "This silver ore is remarkable for its beautiful red color, which is best seen when a fragment is held between the eye and the light. This character has earned for it the title of 'ruby silver,' by which it is generally known. The color, however, is so deep that stout crystals, or opaque masses, appear nearly black by reflected light, hence this specimen is also known as 'black silver,' When powdered, it is cochineal red, and this may be shown by scratching it on a file. It is often found in very perfect crystals, which belong to the rhombohedral system. The prisms are six-sided and terminated by three or more planes. Specimens from Mexico have assayed sulphur 18, antimony 21.8, silver 60.2. This ore is found in Mexico and in several of the silver mines of Europe."

Bleaching Sponge.

I recollect seeing a few months since in your journal some processes for bleaching sponge, but I think in each case the sponge had to be immersed in an acid solution. I have found the following a better way, inasmuch as nothing except gaseous chloride comes in contact with the sponge. In the first place, I get a box and a basin; I then put some sponge on a flat surface, and invert the box over it; in the basin I put some "chloride of lime" and sulphuric acid, and place it under the inverted box. The chlorine becomes quickly disengaged, and in a few minutes imparts to the sponge a nice white appearance, apparently without the slightest injury to its texture. The operation had better be performed in the air, as it soon fills the room or house with a powerful smell of chlorine.—A. W. S., in the *Chemist and Druggist.*

Wild Peppermint as a Rat Exterminator.

Alex. Robertson, writes to the *Canada Farmer*—"I have for the last four years proved to my satisfaction that the 'Wild Peppermint' is a sure and reliable exterminator of rats. In proof of the fact, I will state the result it has had with me. Four years ago my barn was regularly infested with rats; they were so numerous that I had great fears of my whole grain being destroyed by them, after it was housed; but having about two acres of Wild Peppermint that grew in a field of wheat, after the wheat was harvested, the mint was cut and bound with it, and drove the rats from my premises. I have not been troubled with one since, nor am I at present, while my neighbors have any quantity of them. I feel confident that any person who is troubled with these pests, could easily get rid of them by gathering a good supply of the mint and placing it around the walls or base of their barns."

To Remove the Taste of New Wood.—A new keg, churn, bucket, or other wooden vessel, will generally communicate a disagreeable taste to anything that is put into it. To prevent this inconvenience, first scald the vessel well with boiling water, letting the water remain in it till cold. Then dissolve some pearlash, or soda in luke-warm water, adding a little bit of lime to it, and wash the inside of the vessel well with this solution. Afterwards scald it well with plain hot water, and rinse it with cold before you use it.

Profits of the Oil Trade.—The aggregate yield of oil per day, says the *Insurance Reporter*, in all the oil regions of the United States is 6,000 barrels. On this, in its crude state, the average profit is about five dollars per barrel, so that the net profit on all the crude petroleum produced is $30,000 per day, nearly $11,000,000 yearly.

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